Predicting UK stock market short-term activity and returns from Daily Mail Online

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Abstract

In this paper, I'm deriving a direct measure of investor sentiment from Daily Mail Online news articles using SentiWordNet lexical resource for opinion mining, and I find that it has the ability to predict London Stock Exchange market activity and returns. More precisely the results state that all news – not only financial news – can offer a significant input in predicting stock market activity and that the direction of the effects differs between news categories. The dataset used in this paper is unique; it consists of 1,139,243 Daily Mail Online news articles published between years 2008 and 2017.

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Introduction

Attention is a scarce cognitive resource that drives the decisions that we make (Kahneman, 1973) and therefore in the finance literature investor attention has been a hot research topic for a long time. Even though early research on stock markets was based on the Efficient Market Hypothesis (EMH) (Fama, 1970) which states that new information mainly drives stock market prices, there is a growing body of research that critically examines EMH (Malkiel, 2003). Nowadays the question is no longer if investor attention affects the stock prices, but how to measure it (Baker and Wurgler, 2006), and we have seen many attempts to estimate investor attention. The found measures include everything, from sports results (Edmans et al., 2007) to Twitter-feeds (Bollen et al., 2011) and market-based indirect proxies like closed-end fund discounts (Lee et al., 1991).

Now, as computational power is rapidly increasing, and big data is transforming every aspect of our lives (Mayer-Schönberger and Cukier, 2013), it is possible to pursue even more innovative and precise proxies of investor attention.

When trying to exploit the latest technologies, in the quest for finding new ways to measure investor attention, one exciting path to experiment is Opinion Mining (OM). OM is a sub-discipline in between of information retrieval, and computational linguistics, and it is not concerned with the topic of a text document but is interested in the opinion that the document expresses (Esuli and Sebastiani, 2007). When combining OM with the theory that unusually high or low levels of investor sentiment are associated with market trading volumes (De Long et al., 1990; Campbell et al., 1993), it becomes clear that OM can be seen as a very promising tool for predicting stock market movements. To mine opinions, and more importantly, to get meaningful results from OM, one needs a dataset that is extensive enough, and in this paper, I use web scraping to obtain a large dataset of online news articles. Vargiu and Urru (2012) state that "[w]eb scraping is the set of techniques used to automatically get some information from a website instead of manually copying it."

Computational linguistics and natural language analysis are not new viewpoints on estimating financial activities and predicting stock markets. For instance, Antweiler and Frank (2004) have measured the predictive power of Internet Stock Message Boards on stock market vola-

tility. They find statistically significant results on stock market returns when using Naive Bayes and Support Vector Machine algorithms to classify stock market discussions into three categories: buy, hold, and sell. Another significant contribution comes from Paul Tetlock (2007); his research shows that pessimism in a specific column in the Wall Street Journal, called "Abreast of the Market," predicts high market trading volume. Other examples of using computational linguistics in finance research include papers from Li (2006), Tetlock, Saar-Tsechasky, and Macskassy (2008), and Manela and Moreira (2015).

In my research, I weighed 1,139,243 Daily Mail online news articles based on their positive and negative indexes, which were calculated using the SentiWordNet lexical resource. I then mapped those indexes to stock market trading days, and because Daily Mail is a British newspaper, I then compared the sentiment indexes with the Financial Times Stock Exchange 100 Index (FTSE 100), which is a share index of the 100 companies listed on the London Stock Exchange with the highest market capitalization.

My research complements the existing finance research in a couple of ways. Firstly, I do not only measure the predictive power of financial news but also compare the results with other news as well. This is possible because of the large dataset consisting of all the Daily Mail Online news articles published over nine years. Secondly, as this paper measures online media, which has snowballed during the last decades, it offers a vital modern viewpoint in opinion mining for finance applications. Thirdly, the fact that my model uses high-frequency data opens the possibility to use the findings even in weekly or even in daily or weekly trading.

Background

In search of investor sentiment

Ever since John Maynard Keynes (1936) referred to 'animal spirits' in explaining stock market anomalies, there has been extensive interest in capturing and measuring those spirits. One of the recent contributions to theoretically model investor sentiment comes from Barberis Shleifer and Vishny (1998). Their paper presents a parsimonious model of investor sentiment that fits with the findings that there is "underreaction of stock prices to news such as earnings announcements, and overreaction of stock prices to a series of good or bad news ".

On the empirical side, there has been a significant amount of attempts to measure investor sentiment. For instance, Neal and Wheatley (1998) are studying forecasting power of some market-based sentiment measures, including the ratio of odd-lot sales to purchases and closed-end fund discounts. Another interesting example comes from Edmans, García, and Norli (2007). Motivated by psychological research, they find that there is a significant market decline after soccer losses.

Computational linguistics and opinion mining in finance research

Currently, one of the most interesting fields in measuring investor sentiment is opinion mining using large datasets. One of the most influential papers that combine opinion mining in finance research was published by Werner Antweiler and Murray Frank in 2004, when they analyzed 1.5 million messages posted on Yahoo! Finance and Raging Bull about the 45 companies in the Dow Jones Industrial Average and the Dow Jones Internet Index. They found that these messages helped predict market volatility and that the sentiment in these messages was associated with an increased trading volume. They used one of the oldest algorithms, called Naive Bayes, to interpret the text. The data is from the year 2000, and one of the most exciting aspects of the paper is that, at that time, the internet was a relatively new platform, but they still got statistically significant results. After that, the number of internet users has grown almost a tenfold (Internet Live Stats), so it is expected that this effect is even more significant.

Two fascinating studies concerning media in predicting stock markets are from Tetlock (2007) and Manela and Moreira (2015), which use the data from the printed version of the Wall Street Journal (WSJ). Tetlock (2007) uses one particular column in the newspaper called "Abreast of the Market" from the years 1984 to 1998 and analyses the sentiment using the General Inquirer, a manually annotated lexicon, which produces a systematic analysis of text-based documents. They generate the Pessimism Media Factor and find that "[h]igh values of media pessimism induce downward pressure on market prices; unusually high or low pessimism lead to temporarily high market trading volume." Asaf Manela and Alan Moreira (2015) derive a news-implied volatility index (NVIX) from the front page of WSJ to predict high future returns in normal times and find that NVIX rises just before transitions into economic disasters.

Data and methodology

News articles

For this study, I gathered a total of 2,337,016 news articles from Daily Mail Online (DMO), which is based on the Daily Mail newspaper. Daily Mail is a British daily middle-market[1] tabloid newspaper published in London (Pilger, 1998). The main reason why I use DMO as the primary source for the research is that it is widely considered as one of the largest online newspapers in the English-speaking world[2]. Another reason for selecting DMO as the primary source is that it lets out a large number of articles each day; for instance, the article count for 2016 is more than 450,000.

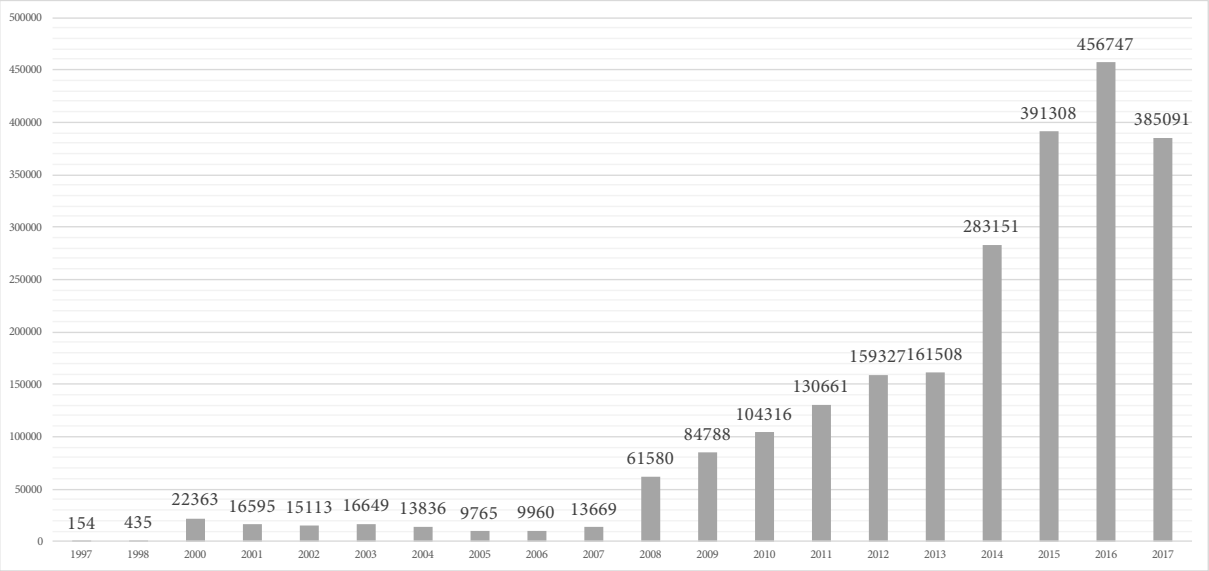

Figure 1: Number of news articles published by Daily Mail Online per year

For the analyses to be valid, I choose the years that have on average over 100 published articles daily and for the time series to be consistent the timespan of the research is from the beginning of July 2008 until the end of June 2017. With these conditions, the news article count is 1,995,142.

1 Middle-market newspaper is a newspaper that attracts readers who want some entretainment, but still a basic coverage of important news events.

2 Two of the sources suggest that DMO is the most-visited English-language newspaper website in the world (Wheeler, 2012 and BrandRepublic, 2014), and SimilarWeb (2017) ranks DMO as the third-most-read English-language newspaper in the world.

Calculating the sentiment

To calculate positivity and negativity of a single news article, I use SentiWordNet 3.0 (SWN) (Baccianella, Esuli, and Sebastiani, 2010) which is a lexical resource based on WordNet (Miller, 1995). It consists of positivity, negativity and objectivity values for 117,000 English words. Each of the three scores ranges in the interval [0.0, 1.0], and their sum is 1.0 for each synset. From SWN, I use the positivity and negativity scores to count the total positivity and total negativity scores for an article.

The reason for using SWN in this paper is that the sentimental analyses of many of the earlier papers are based on algorithms that rely on word lists that give equal weight to all the words. The use of SWN enables me to build much more sophisticated sentimental models because the words are labeled by using numerical scores, and it has an extensive coverage of words. On the other hand, I do not use machine learning technologies or neural networks, because I believe that it is essential to have a somewhat intuitive understanding of what the algorithms are doing, especially because this is a study in the field of finance. For instance, when using neural networks, the output easily becomes difficult to understand, but when we can see the positivity and negativity weights, we achieve an intuitive understanding of what we are measuring.

Rank	Positive	Negative
1	good#n#2 goodness#n#2	abject#a#2
2	better off#a#1	deplorable#a#1 distressing#a#2 lamentable#a#1 pitiful#a#2 sad#a#3 sorry#a#2
3	divine#a#6 elysian#a#2 inspired#a#1	bad#a#10 unfit#a#3 unsound#a#5
4	good enough#a#1	scrimy#a#1
5	solid#a#1	cheapjack#a#1 shoddy#a#1 tawdry#a#2
6	superb#a#2	unfortunate#a#3
7	good#a#3	inauspicious#a#1 unfortunate#a#2
8	goody-goody#a#1	unfortunate#a#1
9	amiable#a#1 good-humored#a#1 good-humoured#a#1	dispossessed#a#1 homeless#a#2 roofless#a#2
10	gainly#a#1	hapless#a#1 miserable#a#2 misfortunate#a#1 pathetic#a#1 piteous#a#1 pitiable#a#2 pitiful#a#3 poor#a#1 wretched#a#5

Table 1: The 10 top-ranked positive synsets and the 10 top-ranked negative synsets in SentiWordNet 3.0 (Baccianella, Esuli and Sebastiani, 2010)

After calculating the negativity and positivity, I arrange the articles, based on the trading day on which they were published on the London Stock Exchange (LSE,) and I sort them into the following groups:

- intraday articles, which are published during the trading day, and
- overnight articles, which are published before the actual trading day, but after the earlier.

I then count the overall intraday and overnight positivity and negativity for each trading day in my sample by dividing the positivity and negativity scores with the character counts of the articles.

$$Sentiment\ index_{pos} = \frac{Score_{pos}}{Count_{characters}} \qquad Sentiment\ index_{neg} = \frac{Score_{neg}}{Count_{characters}}$$

I also sort the intraday and overnight positivity and negativity by the category in which the news article is published. As the categories are not stable throughout the chosen time span, I include four main categories, which are:

- money
- news
- sport
- TV & show business

These all have occurrences from the beginning until the end consistently. Not doing so would severely compromise the quality of the dataset. For instance, on the 1st of April, 2014, DMO introduced a new "Wires" category, which changed the sentiment of the dataset significantly. This effect can be seen in figure 2. This effect can be seen in figure 2. It is not reasonable to argue that introduction of a single category would permanently change the overall news sentiment. With these four categories, the final news article count is 1,139,243 articles.

For each trading day, I calculate the sentiment indexes for the following news category subsets:

- all news
- money-categorized news (money news)
- all news, excluding money-categorized news (other news)

For each category subset, I calculate the positive sentiment index (PSI), the negative senti-

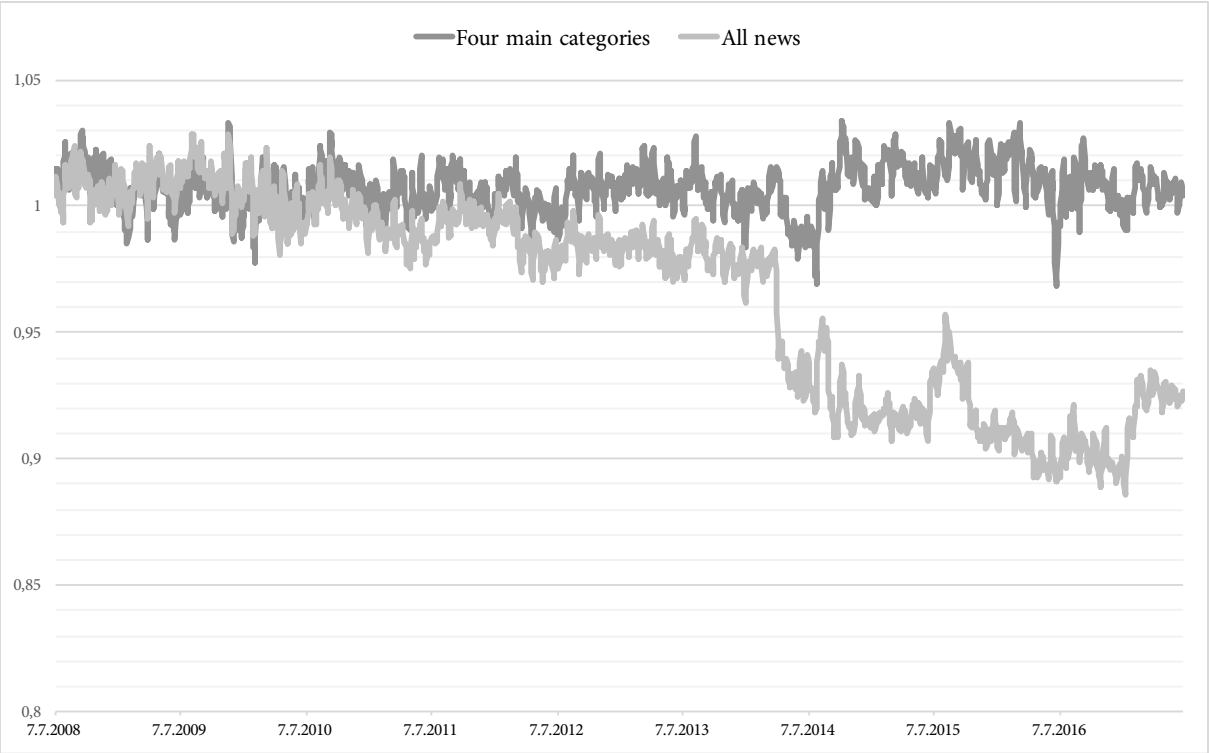

Figure 2: Overall sentiment measured with all news and with news from four main categories.

ment index (NSI), and the overall sentiment index (OSI), starting from the earlier trading day opening time to the current trading day opening time. I also calculate ten-day moving averages (PSI_{10}, $NSI_{10,}$ OSI_{10}). All the articles that are taken into account have been published before the opening time of the current trading day, which is done to ensure that I measure predictive power, not just correlation.

Financial data

For the trading days, I use the FTSE 100 opening, closing, high and low price data and the daily volume from Intercontinental Exchange, Inc. For the return, absolute return, ten-day return, ten-day absolute return, volatility, and ten-day volume I use the following formulas:

$$Return = \frac{Price_{Close}}{Price_{Open}} - 1 \qquad Return_{Abs} = \left|\frac{Price_{Close}}{Price_{Open}} - 1\right|$$

$$\text{10-day return}_{T} = \frac{Price_{T+10_{Close}}}{Price_{T_{Open}}} - 1 \qquad \text{10-day return}_{T_{Abs}} = \left|\frac{Price_{T+10_{Close}}}{Price_{T_{Open}}} - 1\right|$$

$$Volatility = \frac{Price_{High} - Price_{Low}}{Price_{Open}} \qquad \text{10-day volume}_T = \sum_{i=T}^{T+10} Volume_i$$

Financial crisis

The dataset is impacted by the 2007-2008 financial crisis, which, on the one hand, provides captivating viewpoints for predicting from sentiment analysis but, on the other hand, compromises the data at the beginning of the dataset. To minimize errors that occur because of the crisis, I'm also duplicating all the results with a dataset that starts from the 1st of July 2010. The sample size with the financial crisis in the dataset is 2274 trading days and without financial crisis 1770 trading days.

The Box-Cox transformation technique

To remove heteroscedasticity in my regression models, I'm using the Box-Cox transformation technique (BC transformation). It is a parametric power transformation technique introduced by Box and Cox in 1964. It is commonly used to reduce anomalies such as non-additivity, non-normality and heteroscedasticity (Sakia, 1992).

Results

All news

Returns

All news PSI, NSI, OSI, PSI_{10}, NSI_{10} or OSI_{10} don't seem to correlate with stock market one-day returns at all; the situation doesn't change when comparing with ten-day returns. When removing the financial crisis from the dataset, one-day returns are still not predictable from any of the all news data, but ten-day returns become slightly significant (5% significance) negatively correlated with one-day PSI, suggesting that positive news would mean that returns are somewhat going to decline over the ten-day period. When comparing ten-day returns with ten-day sentiment indexes, I find that OSI_{10} doesn't correlate with ten-day returns at all, but PSI_{10} (5% significance) and NSI_{10} (1% significance) both correlate in opposite directions sug-

gesting that they both have some explanatory value in returns. The negative ten-day sentiment seems to predict slightly positive ten-day returns (5% significance), and the positive ten-day sentiment appears to predict slightly negative ten-day returns (1% significance).

Regression							Summary				Summary (with the BC transformation)			
	y			x		Financial crisis	P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
	Return	1-day	~	**All news**	**OSI**	YES	0,8156	-0,0041	0,0000	0,0004				
	Return	1-day	~	**All news**	+ **PSI**	YES	0,5715	-0,0062	0,0001	0,0036				
	Return	1-day	~	**All news**	- **NSI**	YES	0,8585	0,0022	0,0000	0,0000				
	Return	10-day	~	**All news**	**OSI**	YES	0,1081	-0,0780	0,0011	0,0193				
	Return	10-day	~	**All news**	+ **PSI**	YES	0,2559	-0,0345	0,0006	0,0000				
	Return	10-day	~	**All news**	- **NSI**	YES	0,5889	-0,0189	0,0001	0,0000				
	Return	1-day	~	**All news**	**OSI** 10	YES	0,5242	0,0207	0,0002	0,0000				
	Return	1-day	~	**All news**	+ **PSI** 10	YES	0,8298	0,0032	0,0000	0,0000				
	Return	1-day	~	**All news**	- **NSI** 10	YES	0,6569	0,0080	0,0001	0,0000				
	Return	10-day	~	**All news**	**OSI** 10	YES	0,4361	-0,0701	0,0003	0,0001				
	Return	10-day	~	**All news**	+ **PSI** 10	YES	0,3307	-0,0400	0,0004	0,0000				
	Return	10-day	~	**All news**	- **NSI** 10	YES	0,7786	0,0141	0,0000	0,0000				
	Return	1-day	~	**All news**	**OSI**	NO	0,5420	0,0100	0,0002	0,0946 OK				
	Return	1-day	~	**All news**	+ **PSI**	NO	0,3307	0,0100	0,0005	0,4168 OK				
	Return	1-day	~	**All news**	- **NSI**	NO	0,3173	0,0121	0,0006	0,0002				
	Return	10-day	~	**All news**	**OSI**	NO	0,0897	-0,0802	0,0016	0,2509 OK				
signif.	**Return**	10-day	~	**All news**	+ **PSI**	NO	0,0218 *	-0,0676	0,0030	0,7864 OK				
	Return	10-day	~	**All news**	- **NSI**	NO	0,9567	0,0019	0,0000	0,0178				
	Return	1-day	~	**All news**	**OSI** 10	NO	0,4742	0,0202	0,0003	0,0000				
	Return	1-day	~	**All news**	+ **PSI** 10	NO	0,4100	0,0112	0,0004	0,8864 OK				
	Return	1-day	~	**All news**	- **NSI** 10	NO	0,8814	-0,0026	0,0000	0,0000				
	Return	10-day	~	**All news**	**OSI** 10	NO	0,9799	0,0020	0,0000	0,4386 OK				
signif.	**Return**	10-day	~	**All news**	+ **PSI** 10	NO	0,0317 *	-0,0838	0,0026	0,3883 OK				
signif.	**Return**	10-day	~	**All news**	- **NSI** 10	NO	0,0069 **	0,1375	0,0041	0,0984 OK				

Table 2: Results from *Return ~ All news* regression tests

Absolute returns

When comparing sentiment indexes with absolute returns, the predictive power gets significantly higher, as the theories suggest. All news PSI and NSI seem to predict one-day, and ten-day absolute returns well (0.1% significance), and OSI also predicts one-day absolute returns well (0.1% significance). Also, all of the ten-day sentiment indexes correlate statistically significantly with absolute one-day and ten-day returns. The problem with these tests is that they all fail in the Breusch-Pagan test (5% significance), meaning that all of these results struggle with heteroscedasticity. The BC transformation removes the heteroscedasticity from PSI and PSI_{10} which means that by predicting ten-day absolute returns with PSI and PSI_{10}, the results are also homoscedastic.

Heteroscedasticity can also be, to some extent, explained through the financial crisis. During the crisis, the sentiment levels of news articles varied on a larger scale, and the markets encountered higher absolute returns. When removing financial crisis from the dataset, we can see that negative one-day and ten-day sentiment indexes have predictive power on absolute returns with high significance, but PSI or OSI don't seem to correlate with absolute returns at all. Also, some of the heteroscedasticity problems seemed to vanish, which is in line with

earlier studies that show that negative investor sentiment predicts activity in the stock market.

	Regression						Financial crisis	Summary				Summary (with the BC transformation)			
	y			x				P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
	Abs. return	1-day	~	**All news**	**OSI**		YES	0,0005 ***	1,6865	0,0053	0,0014				
	Abs. return	1-day	~	**All news**	**+ PSI**		YES	0,0000 ***	-1,2725	0,0077	0,0454				
	Abs. return	1-day	~	**All news**	**- NSI**		YES	0,0000 ***	3,3657	0,0409	0,0000				
	Abs. return	10-day	~	**All news**	**OSI**		YES	0,0695	1,0433	0,0014	0,0204				
signif.	**Abs. return**	10-day	~	**All news**	**+ PSI**		YES	0,0000 ***	-2,2012	0,0165	0,0027	0,0000 ***	-3,7279	0,0156	0,1821 OK
	Abs. return	10-day	~	**All news**	**- NSI**		YES	0,0000 ***	3,6497	0,0344	0,0000	0,0000 ***	5,7124	0,0277	0,0032
	Abs. return	1-day	~	**All news**	**OSI**	10	YES	0,0000 ***	5,5386	0,0166	0,0000				
	Abs. return	1-day	~	**All news**	**+ PSI**	10	YES	0,0000 ***	-2,4993	0,0162	0,0005				
	Abs. return	1-day	~	**All news**	**- NSI**	10	YES	0,0000 ***	6,9112	0,0831	0,0000				
	Abs. return	10-day	~	**All news**	**OSI**	10	YES	0,0070 **	2,8699	0,0032	0,0000	0,0070 **	2,9389	0,0011	0,0108
signif.	**Abs. return**	10-day	~	**All news**	**+ PSI**	10	YES	0,0000 ***	-3,9840	0,0294	0,0002	0,0000 ***	-6,9057	0,0291	0,4946 OK
	Abs. return	10-day	~	**All news**	**- NSI**	10	YES	0,0000 ***	7,3931	0,0680	0,0000	0,0000 ***	11,5771	0,0549	0,0001
	Abs. return	1-day	~	**All news**	**OSI**		NO	0,0601	0,8010	0,0020	0,1842 OK				
	Abs. return	1-day	~	**All news**	**+ PSI**		NO	0,4136	-0,2176	0,0004	0,5695 OK				
	Abs. return	1-day	~	**All news**	**- NSI**		NO	0,0000 ***	1,4272	0,0117	0,0142				
	Abs. return	10-day	~	**All news**	**OSI**		NO	0,2142	0,6649	0,0009	0,4991 OK				
	Abs. return	10-day	~	**All news**	**+ PSI**		NO	0,3523	-0,3110	0,0005	0,9850 OK				
signif.	**Abs. return**	10-day	~	**All news**	**- NSI**		NO	0,0043 **	1,1231	0,0046	0,0983 OK	0,0043 **	2,4137	0,0049	0,7012 OK
	Abs. return	1-day	~	**All news**	**OSI**	10	NO	0,0000 ***	3,3684	0,0119	0,0024				
	Abs. return	1-day	~	**All news**	**+ PSI**	10	NO	0,6724	-0,1489	0,0001	0,8830 OK				
	Abs. return	1-day	~	**All news**	**- NSI**	10	NO	0,0000 ***	2,8162	0,0212	0,0000				
	Abs. return	10-day	~	**All news**	**OSI**	10	NO	0,1642	1,2832	0,0011	0,9184 OK				
	Abs. return	10-day	~	**All news**	**+ PSI**	10	NO	0,2042	-0,5615	0,0009	0,6841 OK				
signif.	**Abs. return**	10-day	~	**All news**	**- NSI**	10	NO	0,0010 **	1,8914	0,0061	0,3634 OK	0,0010 **	4,6344	0,0083	0,5124 OK

Table 3: Results from *Absolute returns ~ All news* regression tests

Volume

When predicting volume from all news sentimental indexes, it seems that positive index cools the stock market volume down, and the negative one heats it up. The findings are statistically very significant in all cases (0.1% significance), but there is heteroscedasticity in almost all of the cases. Figure 3 highlights the problem. Again, removing the financial crisis removes some of the issues, but still, the Breusch-Pagan tests fail (5% significance). For instance, when measuring the effect of NSI_{10} on ten-day volume, it is clear that most of the heteroscedasticity is caused by the financial crisis (on the left), but the right-hand regression still fails the Breusch-Pagan test with 5% significance.

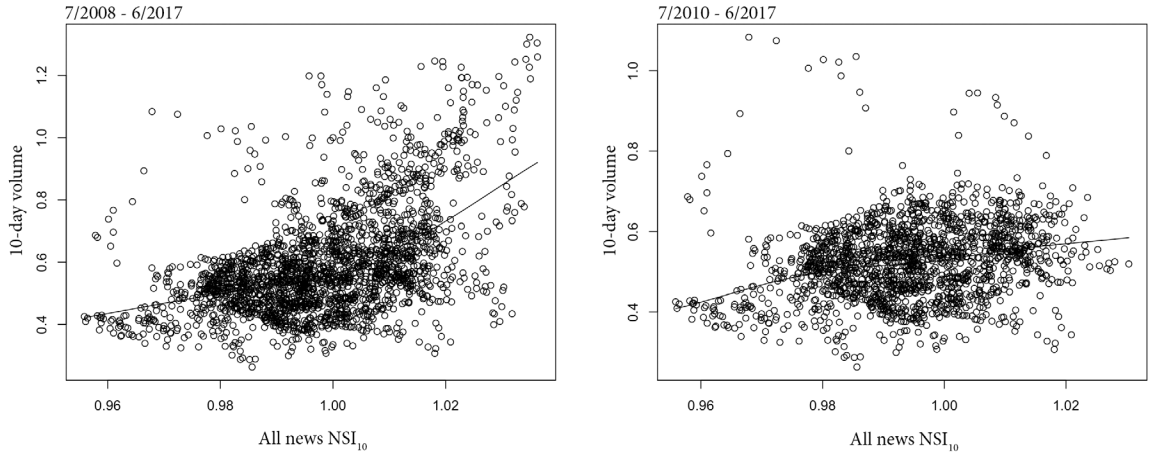

Figure 3: *Ten-day volume ~ All news* NSI_{10} scatter diagrams with and without financial crisis

The results that don't suffer from heteroscedasticity when the financial crisis is removed are that PSI_{10} has a small negative impact on one-day trading volume and that NSI10 has a slight positive effect on one-day trading volume. Both of the results are significant with a 0.1% significance level. It is notable that almost all of the results are statistically very significant (p-value is very close to zero) and the logic is the same in all of the results; when all news are positive, the trading volume drops, and when the news are negative, the trading volume increases.

Regression							Summary				Summary (with the BC transformation)			
	y			x		Financial crisis	P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
	Volume	1-day	~	**All news**	**OSI**	YES	0,9322	-0,0222	0,0000	0,1675 OK				
	Volume	1-day	~	**All news**	+ **PSI**	YES	0,0000 ***	-1,8641	0,0574	0,0000				
signif.	**Volume**	1-day	~	**All news**	- **NSI**	YES	0,0000 ***	2,4055	0,0724	0,1080 OK				
	Volume	10-day	~	**All news**	**OSI**	YES	0,2272	0,2868	0,0006	0,5566 OK				
	Volume	10-day	~	**All news**	+ **PSI**	YES	0,0000 ***	-2,0275	0,0820	0,0000	0,0000 ***	-4,2337	0,0709	0,0000
signif.	**Volume**	10-day	~	**All news**	- **NSI**	YES	0,0000 ***	2,8204	0,1203	0,0000	0,0000 ***	6,1871	0,1147	0,6144 OK
	Volume	1-day	~	**All news**	**OSI** 10	YES	0,1332	0,7261	0,0010	0,5234 OK				
	Volume	1-day	~	**All news**	+ **PSI** 10	YES	0,0000 ***	-3,1808	0,0910	0,0000				
	Volume	1-day	~	**All news**	- **NSI** 10	YES	0,0000 ***	4,9508	0,1480	0,0000				
signif.	**Volume**	10-day	~	**All news**	**OSI** 10	YES	0,0226 *	1,0031	0,0023	0,1141 OK				
	Volume	10-day	~	**All news**	+ **PSI** 10	YES	0,0000 ***	-3,6148	0,1420	0,0000	0,0000 ***	-7,4538	0,1197	0,0000
	Volume	10-day	~	**All news**	- **NSI** 10	YES	0,0000 ***	5,7345	0,2399	0,0000	0,0000 ***	12,5140	0,2264	0,0005
	Volume	1-day	~	**All news**	**OSI**	NO	0,8771	0,0349	0,0000	0,0119				
	Volume	1-day	~	**All news**	+ **PSI**	NO	0,0001 ***	-0,5595	0,0089	0,0440				
	Volume	1-day	~	**All news**	- **NSI**	NO	0,0000 ***	0,7606	0,0118	0,0070				
	Volume	10-day	~	**All news**	**OSI**	NO	0,5298	0,1027	0,0002	0,0000				
	Volume	10-day	~	**All news**	+ **PSI**	NO	0,0000 ***	-0,4732	0,0122	0,0000	0,0000 ***	-0,7565	0,0088	0,0000
	Volume	10-day	~	**All news**	- **NSI**	NO	0,0000 ***	0,7399	0,0214	0,0001				
	Volume	1-day	~	**All news**	**OSI** 10	NO	0,4205	0,3136	0,0004	0,0007				
signif.	**Volume**	1-day	~	**All news**	+ **PSI** 10	NO	0,0002 ***	-0,6942	0,0078	0,0624 OK				
signif.	**Volume**	1-day	~	**All news**	- **NSI** 10	NO	0,0000 ***	1,3654	0,0178	0,0672 OK				
	Volume	10-day	~	**All news**	**OSI** 10	NO	0,0063 **	0,7683	0,0042	0,0000				
	Volume	10-day	~	**All news**	+ **PSI** 10	NO	0,0000 ***	-0,6148	0,0117	0,0009				
	Volume	10-day	~	**All news**	- **NSI** 10	NO	0,0000 ***	1,5842	0,0457	0,0370				

Table 4: Results from *Volume ~ All news* regression tests

Volatility

When viewing data that includes the financial crisis, all of the sentiment indexes correlate with one-day volatility, and all of the results are highly statistically significant (0.1% significance). Again, problems come with heteroscedasticity. This time removing financial crisis from the dataset helps significantly, and without the financial crisis, NSI and OSI_{10} predict volatility well (0.1% significance). When applying BC transformation on volatility, NSI_{10} also becomes homoscedastic and statistically very significant (0.1% significance).

The figure 4 shows the dramatic enhancement in homoscedasticity when applying BC transformation to volatility and regressing it to NSI_{10}.

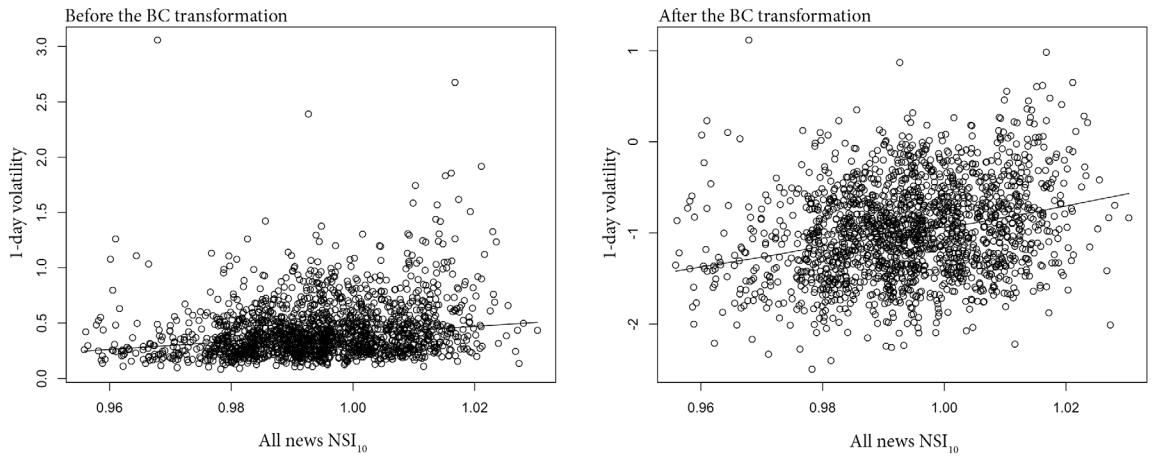

Figure 4: *one-day volatility ~ All news NSI*$_{10}$ scatter diagrams with and without the BC transformation

Regression							Financial crisis	Summary				Summary (with the BC transformation)			
	y			x				P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
signif.	**Volatility**	1-day	~	**All news**		**OSI**	YES	0,0002 ***	1,9477	0,0061	0,0242	0,0002 ***	3,2304	0,0069	0,6758 OK
	Volatility	1-day	~	**All news**	+	**PSI**	YES	0,0000 ***	-2,6265	0,0285	0,0028	0,0000 ***	-4,3636	0,0324	0,0369
	Volatility	1-day	~	**All news**	-	**NSI**	YES	0,0000 ***	5,1561	0,0831	0,0000	0,0000 ***	8,5176	0,0936	0,0153
	Volatility	1-day	~	**All news**		**OSI** 10	YES	0,0000 ***	7,2190	0,0245	0,0000	0,0000 ***	10,9634	0,0233	0,0175
signif.	**Volatility**	1-day	~	**All news**	+	**PSI** 10	YES	0,0000 ***	-4,5904	0,0474	0,0001	0,0000 ***	-7,6493	0,0542	0,0786 OK
	Volatility	1-day	~	**All news**	-	**NSI** 10	YES	0,0000 ***	10,8977	0,1791	0,0000	0,0000 ***	17,5111	0,1908	0,0000
signif.	**Volatility**	1-day	~	**All news**		**OSI**	NO	0,0103 *	1,1223	0,0037	0,3552 OK				
signif.	**Volatility**	1-day	~	**All news**	+	**PSI**	NO	0,0080 **	-0,7241	0,0040	0,0617 OK	0,0080 **	-1,1739	0,0027	0,1334 OK
signif.	**Volatility**	1-day	~	**All news**	-	**NSI**	NO	0,0000 ***	2,1061	0,0242	0,3087 OK	0,0000 ***	4,8197	0,0323	0,7573 OK
signif.	**Volatility**	1-day	~	**All news**		**OSI** 10	NO	0,0000 ***	4,4286	0,0195	0,3368 OK	0,0000 ***	10,1539	0,0262	0,4258 OK
	Volatility	1-day	~	**All news**	+	**PSI** 10	NO	0,0512	-0,7050	0,0021	0,4412 OK				
signif.	**Volatility**	1-day	~	**All news**	-	**NSI** 10	NO	0,0000 ***	4,5284	0,0520	0,0138	0,0000 ***	9,9619	0,0643	0,1776 OK

Table 5: Results from *Volatility ~ All news* regression tests

Money-categorized news (Money news)

Returns

With the financial crisis in the dataset, there seems to be no predictive power with Money news sentiment levels on one-day or ten-day returns. After removing the financial crisis from the dataset, there appears to be predictive power with Money news PSI and OSI on one-day returns. On the contrary, it seems that Money news NSI seems to have some predictive power on ten-day return. The effect direction is the same in both cases. All of these results are significant with a 5% significance level. Money news PSI$_{10}$, NSI$_{10}$ or OSI$_{10}$ don't seem to have any predictive power on one-day returns, especially NSI$_{10}$ appears to have statistically significant (1% significance) effect on ten-day returns, but again, it fails in the Breusch-Pagan test with a 5% significance level. The BC transformation doesn't help in any of the cases.

	Regression					Summary				Summary (with the BC transformation)			
	y			x	Financial crisis	P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
	Return	1-day	~	**Money news OSI**	YES	0,0883	0,0089	0,0013	0,0000				
	Return	1-day	~	**Money news + PSI**	YES	0,3328	0,0046	0,0004	0,0444				
	Return	1-day	~	**Money news - NSI**	YES	0,0606	0,0080	0,0015	0,0000				
	Return	10-day	~	**Money news OSI**	YES	0,7012	0,0055	0,0001	0,0000				
	Return	10-day	~	**Money news + PSI**	YES	0,7078	0,0049	0,0001	0,7616 OK				
	Return	10-day	~	**Money news - NSI**	YES	0,7673	0,0035	0,0000	0,0000				
	Return	1-day	~	**Money news OSI** 10	YES	0,8980	0,0009	0,0000	0,0000				
	Return	1-day	~	**Money news + PSI** 10	YES	0,8671	-0,0015	0,0000	0,1215 OK				
	Return	1-day	~	**Money news - NSI** 10	YES	0,7729	0,0016	0,0000	0,0000				
	Return	10-day	~	**Money news OSI** 10	YES	0,5404	0,0126	0,0002	0,0000				
	Return	10-day	~	**Money news + PSI** 10	YES	0,4495	0,0184	0,0003	0,0097				
	Return	10-day	~	**Money news - NSI** 10	YES	0,6565	0,0069	0,0001	0,0000				
	Return	1-day	~	**Money news OSI**	NO	0,0230 *	0,0102	0,0029	0,0010				
signif.	**Return**	1-day	~	**Money news + PSI**	NO	0,0223 *	0,0092	0,0029	0,7017 OK				
	Return	1-day	~	**Money news - NSI**	NO	0,0865	0,0065	0,0017	0,0000				
	Return	10-day	~	**Money news OSI**	NO	0,1121	0,0206	0,0014	0,1859 OK				
	Return	10-day	~	**Money news + PSI**	NO	0,8889	0,0016	0,0000	0,0745 OK				
	Return	10-day	~	**Money news - NSI**	NO	0,0149 *	0,0267	0,0033	0,0003				
	Return	1-day	~	**Money news OSI** 10	NO	0,5871	-0,0035	0,0002	0,0009				
	Return	1-day	~	**Money news + PSI** 10	NO	0,9445	-0,0005	0,0000	0,5871 OK				
	Return	1-day	~	**Money news - NSI** 10	NO	0,4364	-0,0040	0,0003	0,0000				
signif.	**Return**	10-day	~	**Money news OSI** 10	NO	0,0169 *	0,0448	0,0032	0,0731 OK				
	Return	10-day	~	**Money news + PSI** 10	NO	0,4935	0,0145	0,0003	0,9107 OK				
	Return	10-day	~	**Money news - NSI** 10	NO	0,0015 **	0,0466	0,0057	0,0052				

Table 6: Results from *Return ~ Money news* regression tests

Absolute returns

When predicting absolute returns, the Money news sentiment is a good predictor. With the financial crisis in the dataset, especially the negative sentiment predicts one-day and ten-day returns with very statistically significant results (p-value < 2e-16). But again, in all of the results with the financial crisis, there is heteroscedasticity. The BC transformation for ten-day absolute returns helps in removing heteroscedasticity, after which Money news PSI_{10} is a statistically very significant (0.01% significance), homoscedastic explanatory of the ten-day absolute return.

When removing the financial crisis from the dataset, the results get very interesting. The findings state that Money news PSI and PSI_{10} do not predict absolute one-day or ten-day returns at all. On the contrary, NSI and NSI_{10} both explain absolute one-day and ten-day returns statistically very significantly (0.1% significance). Also, applying the BC transformation to absolute ten-day returns removes the heteroscedasticity from NSI and NSI_{10}.

	Regression					Summary				Summary (with the BC transformation)			
	y			x	Financial crisis	P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
	Abs. return	1-day	~	**Money news OSI**	YES	0,0000 ***	1,1130	0,0261	0,0000				
signif.	**Abs. return**	1-day	~	**Money news + PSI**	YES	0,0136 *	0,3252	0,0027	0,0800 OK				
	Abs. return	1-day	~	**Money news - NSI**	YES	0,0000 ***	1,1924	0,0442	0,0000				
	Abs. return	10-day	~	**Money news OSI**	YES	0,0000 ***	1,2600	0,0239	0,0001	0,0000 ***	2,1610	0,0231	0,0313
	Abs. return	10-day	~	**Money news + PSI**	YES	0,4098	0,1286	0,0003	0,9769 OK				
	Abs. return	10-day	~	**Money news - NSI**	YES	0,0000 ***	1,5245	0,0516	0,0000	0,0000 ***	2,5376	0,0471	0,0011
	Abs. return	1-day	~	**Money news OSI** $_{10}$	YES	0,0000 ***	1,9339	0,0390	0,0000				
signif.	**Abs. return**	1-day	~	**Money news + PSI** $_{10}$	YES	0,0130 *	0,6034	0,0027	0,2001 OK				
	Abs. return	1-day	~	**Money news - NSI** $_{10}$	YES	0,0000 ***	1,9166	0,0669	0,0000				
	Abs. return	10-day	~	**Money news OSI** $_{10}$	YES	0,0000 ***	2,5214	0,0475	0,0000	0,0000 ***	4,1996	0,0433	0,0003
signif.	**Abs. return**	10-day	~	**Money news + PSI** $_{10}$	YES	0,0001 ***	1,0923	0,0064	0,0313	0,0001 ***	2,0372	0,0073	0,0878 OK
	Abs. return	10-day	~	**Money news - NSI** $_{10}$	YES	0,0000 ***	2,3817	0,0739	0,0000	0,0000 ***	3,8832	0,0646	0,0001
	Abs. return	1-day	~	**Money news OSI**	NO	0,0001 ***	0,4632	0,0089	0,0177				
	Abs. return	1-day	~	**Money news + PSI**	NO	0,5330	0,0652	0,0002	0,9909 OK				
	Abs. return	1-day	~	**Money news - NSI**	NO	0,0000 ***	0,5784	0,0193	0,0004				
signif.	**Abs. return**	10-day	~	**Money news OSI**	NO	0,0050 **	0,4109	0,0044	0,6795 OK				
	Abs. return	10-day	~	**Money news + PSI**	NO	0,3102	-0,1333	0,0006	0,0304				
signif.	**Abs. return**	10-day	~	**Money news - NSI**	NO	0,0000 ***	0,6665	0,0163	0,0160	0,0000 ***	1,3875	0,0161	0,6378 OK
	Abs. return	1-day	~	**Money news OSI** $_{10}$	NO	0,0000 ***	0,7359	0,0107	0,0118				
	Abs. return	1-day	~	**Money news + PSI** $_{10}$	NO	0,8390	0,0389	0,0000	0,2963 OK				
	Abs. return	1-day	~	**Money news - NSI** $_{10}$	NO	0,0000 ***	0,8557	0,0236	0,0000				
signif.	**Abs. return**	10-day	~	**Money news OSI** $_{10}$	NO	0,0002 ***	0,8025	0,0081	0,2534 OK	0,0002 ***	1,7952	0,0092	0,6300 OK
	Abs. return	10-day	~	**Money news + PSI** $_{10}$	NO	0,4207	0,1935	0,0004	0,5475 OK				
signif.	**Abs. return**	10-day	~	**Money news - NSI** $_{10}$	NO	0,0000 ***	0,8652	0,0153	0,0539 OK	0,0000 ***	1,8588	0,0161	0,5715 OK

Table 7: Results from *Absolute return ~ Money news* regression tests

Volume

With the financial crisis in the dataset, the results are apparent; practically all sentiment in Money news correlates with high one-day and ten-day trading volumes. All of the results are heteroscedastic, and the BC transformation doesn't help in any of the cases. Interestingly, removing the financial crisis changes the results quite a lot. After eliminating the financial crisis from the dataset, the predictive power of NSI and NSI_{10} vanishes completely, but PSI and PSI_{10} become statistically very significant (0.1% significance), and also heteroscedasticity is reduced significantly. With the BC transformation, all the results are homoscedastic according to the Breusch-Pagan test (5% significance).

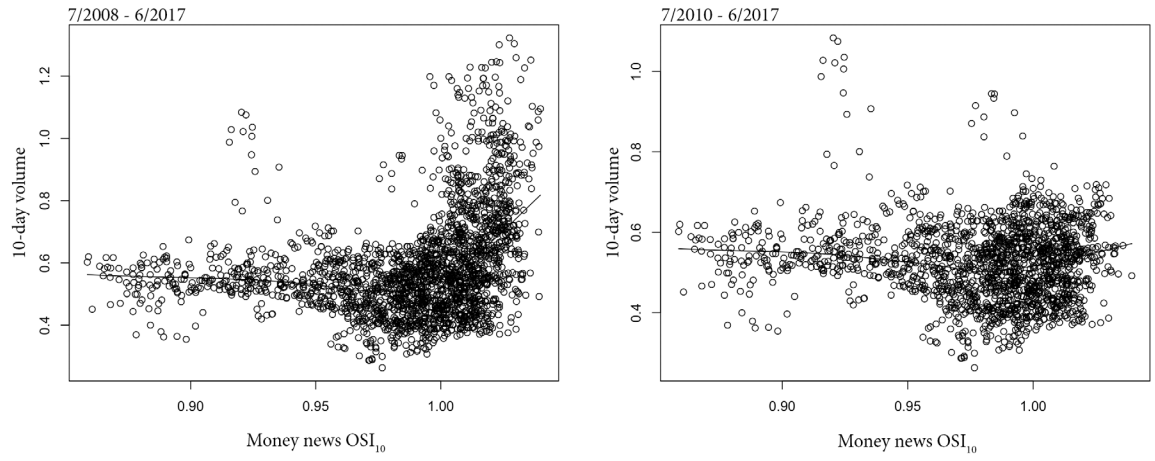

Figure 5: *Ten-day volume ~ Money news* OSI_{10} scatter diagrams with and without the financial crisis

Regression							Summary				Summary (with the BC transformation)			
	y			x		Financial crisis	P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
	Volume	1-day	~	Money news OSI		YES	0,0000 ***	0,6167	0,0278	0,0000				
	Volume	1-day	~	Money news + PSI		YES	0,0946	0,1184	0,0012	0,0116				
	Volume	1-day	~	Money news - NSI		YES	0,0000 ***	0,7057	0,0536	0,0000				
	Volume	10-day	~	Money news OSI		YES	0,0000 ***	0,6999	0,0432	0,0000	0,0000 ***	1,3154	0,0302	0,0000
	Volume	10-day	~	Money news + PSI		YES	0,0041 **	0,1847	0,0036	0,0006				
	Volume	10-day	~	Money news - NSI		YES	0,0000 ***	0,7642	0,0760	0,0000	0,0000 ***	1,4941	0,0576	0,0000
	Volume	1-day	~	Money news OSI	10	YES	0,0000 ***	1,1946	0,0517	0,0001				
	Volume	1-day	~	Money news + PSI	10	YES	0,0002 ***	0,4879	0,0061	0,0161				
	Volume	1-day	~	Money news - NSI	10	YES	0,0000 ***	1,1398	0,0821	0,0000				
	Volume	10-day	~	Money news OSI	10	YES	0,0000 ***	1,3697	0,0821	0,0000	0,0000 ***	2,5693	0,0572	0,0000
	Volume	10-day	~	Money news + PSI	10	YES	0,0000 ***	0,5105	0,0081	0,0000				
	Volume	10-day	~	Money news - NSI	10	YES	0,0000 ***	1,3256	0,1341	0,0000	0,0000 ***	2,5768	0,1004	0,0000
	Volume	1-day	~	Money news OSI		NO	0,2489	-0,0714	0,0008	0,8582 OK				
signif.	Volume	1-day	~	Money news + PSI		NO	0,0001 ***	-0,2177	0,0087	0,7268 OK				
	Volume	1-day	~	Money news - NSI		NO	0,1396	0,0775	0,0012	0,6781 OK				
signif.	Volume	10-day	~	Money news OSI		NO	0,0234 *	-0,1014	0,0029	0,3285 OK	0,0234 *	-0,1931	0,0030	0,5133 OK
signif.	Volume	10-day	~	Money news + PSI		NO	0,0000 ***	-0,1887	0,0125	0,0624 OK	0,0000 ***	-0,3489	0,0121	0,4959 OK
	Volume	10-day	~	Money news - NSI		NO	0,7275	0,0132	0,0001	0,7310 OK				
signif.	Volume	1-day	~	Money news OSI	10	NO	0,0459 *	-0,1790	0,0023	0,2264 OK				
signif.	Volume	1-day	~	Money news + PSI	10	NO	0,0000 ***	-0,5254	0,0152	0,0760 OK				
	Volume	1-day	~	Money news - NSI	10	NO	0,7345	0,0238	0,0001	0,3471 OK				
signif.	Volume	10-day	~	Money news OSI	10	NO	0,0002 ***	-0,2455	0,0081	0,2736 OK				
signif.	Volume	10-day	~	Money news + PSI	10	NO	0,0000 ***	-0,6267	0,0413	0,0006	0,0000 ***	-1,1730	0,0408	0,0845 OK
	Volume	10-day	~	Money news - NSI	10	NO	0,8522	-0,0095	0,0000	0,4066 OK				

Table 8: Results from *Volume ~ Money news* regression tests

Volatility

Again, with the financial crisis in the dataset, all of the results are statistically very significant, but heteroscedastic. The only exception is PSI, which has the significance level of only 1%. After the BC transformation, both, PSI and PSI_{10} become homoscedastic. After removing the financial crisis, the pattern is clear: when enhancing the data by applying the BC transformation to volatility, I find that OSI, OSI_{10}, and NSI_{10} predict volatility well (0.1% significance) and those results are homoscedastic.

The results appear to state that especially negative Money news have a strong positive effect on volatility, which is in line with the theory and earlier studies.

Regression							Summary				Summary (with the BC transformation)			
	y			x		Financial crisis	P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
	Volatility	1-day	~	Money news OSI		YES	0,0000 ***	1,7027	0,0529	0,0000	0,0000 ***	2,9538	0,0656	0,0000
signif.	Volatility	1-day	~	Money news + PSI		YES	0,0021 **	0,4354	0,0042	0,0793 OK	0,0021 **	0,8102	0,0059	0,3921 OK
	Volatility	1-day	~	Money news - NSI		YES	0,0000 ***	1,8694	0,0940	0,0000	0,0000 ***	3,2029	0,1139	0,0000
	Volatility	1-day	~	Money news OSI	10	YES	0,0000 ***	3,0929	0,0865	0,0000	0,0000 ***	5,4855	0,1123	0,0000
signif.	Volatility	1-day	~	Money news + PSI	10	YES	0,0001 ***	1,0225	0,0067	0,2887 OK	0,0001 ***	2,2937	0,0140	0,5243 OK
	Volatility	1-day	~	Money news - NSI	10	YES	0,0000 ***	3,0432	0,1462	0,0000	0,0000 ***	5,2132	0,1770	0,0001
signif.	Volatility	1-day	~	Money news OSI		NO	0,0000 ***	0,6683	0,0176	0,0977 OK	0,0000 ***	1,4803	0,0220	0,1844 OK
	Volatility	1-day	~	Money news + PSI		NO	0,6533	0,0483	0,0001	0,6563 OK				
	Volatility	1-day	~	Money news - NSI		NO	0,0000 ***	0,8712	0,0415	0,0083	0,0000 ***	1,8411	0,0474	0,0418
signif.	Volatility	1-day	~	Money news OSI	10	NO	0,0000 ***	1,0417	0,0203	0,3574 OK	0,0000 ***	2,5343	0,0307	0,3937 OK
	Volatility	1-day	~	Money news + PSI	10	NO	0,7175	-0,0711	0,0001	0,0209				
signif.	Volatility	1-day	~	Money news - NSI	10	NO	0,0000 ***	1,2680	0,0491	0,0261	0,0000 ***	2,8208	0,0622	0,0886 OK

Table 9: Results from *Volatility ~ Money news* regression tests

All news excluding money-categorized news (Other news)

Returns

When studying the predictive power of other news on return, it is interesting to notice that especially positive news have a statistically significant negative effect on returns. The results state that after removing financial crisis from the dataset, high PSI and PSI_{10} of Other news have a small but statistically very significant (0.1% significance) negative effect on ten-day returns.

Regression							Summary				Summary (with the BC transformation)			
	y			x		Financial crisis	P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
	Return	1-day	~	**Other news**	**OSI**	YES	0,5139	-0,0100	0,0002	0,0008				
	Return	1-day	~	**Other news**	**+ PSI**	YES	0,7070	-0,0041	0,0001	0,0010				
	Return	1-day	~	**Other news**	**- NSI**	YES	0,5995	-0,0054	0,0001	0,0000				
	Return	10-day	~	**Other news**	**OSI**	YES	0,1088	-0,0678	0,0011	0,0203				
	Return	10-day	~	**Other news**	**+ PSI**	YES	0,0431 *	-0,0608	0,0018	0,0000				
	Return	10-day	~	**Other news**	**- NSI**	YES	0,7816	-0,0080	0,0000	0,0000				
	Return	1-day	~	**Other news**	**OSI** 10	YES	0,4511	0,0207	0,0002	0,0000				
	Return	1-day	~	**Other news**	**+ PSI** 10	YES	0,6213	0,0078	0,0001	0,0000				
	Return	1-day	~	**Other news**	**- NSI** 10	YES	0,7402	0,0047	0,0000	0,0000				
	Return	10-day	~	**Other news**	**OSI** 10	YES	0,6687	-0,0327	0,0001	0,0006				
	Return	10-day	~	**Other news**	**+ PSI** 10	YES	0,1448	-0,0637	0,0009	0,0000				
	Return	10-day	~	**Other news**	**- NSI** 10	YES	0,4044	0,0326	0,0003	0,0000				
	Return	1-day	~	**Other news**	**OSI**	NO	0,3512	0,0136	0,0005	0,1339 OK				
	Return	1-day	~	**Other news**	**+ PSI**	NO	0,3715	0,0099	0,0005	0,8749 OK				
	Return	1-day	~	**Other news**	**- NSI**	NO	0,6270	0,0050	0,0001	0,0571 OK				
signif.	**Return**	10-day	~	**Other news**	**OSI**	NO	0,0023 **	-0,1282	0,0052	0,1352 OK				
signif.	**Return**	10-day	~	**Other news**	**+ PSI**	NO	0,0002 ***	-0,1206	0,0081	0,4644 OK				
	Return	10-day	~	**Other news**	**- NSI**	NO	0,4042	-0,0245	0,0004	0,1627 OK				
	Return	1-day	~	**Other news**	**OSI** 10	NO	0,1993	0,0307	0,0009	0,0000				
	Return	1-day	~	**Other news**	**+ PSI** 10	NO	0,1362	0,0241	0,0013	0,0473				
	Return	1-day	~	**Other news**	**- NSI** 10	NO	0,8229	0,0031	0,0000	0,0001				
	Return	10-day	~	**Other news**	**OSI** 10	NO	0,1110	-0,1099	0,0014	0,0205				
signif.	**Return**	10-day	~	**Other news**	**+ PSI** 10	NO	0,0000 ***	-0,1963	0,0101	0,3811 OK				
	Return	10-day	~	**Other news**	**- NSI** 10	NO	0,0931	0,0667	0,0016	0,1616 OK				

Table 10: Results from *Return ~ Other news* regression tests

Absolute returns

Compared to Money news, Other news are relatively bad predictors of absolute returns, which is somewhat intuitive and most of the predictive power is due to the financial crisis. When measuring absolute returns, the trend is that negative Other news estimates higher absolute returns and positive Other news forecasts lower absolute returns. Without the financial crisis only it seems that NSI of Other news predicts one-day absolute returns and NSI_{10} predicts ten-day absolute returns.

Regression							Summary				Summary (with the BC transformation)			
	y			x		Financial crisis	P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
	Abs. return	1-day	~	**Other news**	**OSI**	YES	0,0009 ***	1,4057	0,0049	0,0038				
	Abs. return	1-day	~	**Other news**	**+ PSI**	YES	0,0000 ***	-1,2993	0,0082	0,0191				
	Abs. return	1-day	~	**Other news**	**- NSI**	YES	0,0000 ***	2,4237	0,0312	0,0000				
	Abs. return	10-day	~	**Other news**	**OSI**	YES	0,2102	0,6274	0,0007	0,0078				
signif.	**Abs. return**	10-day	~	**Other news**	**+ PSI**	YES	0,0000 ***	-2,2392	0,0174	0,0193	0,0000 ***	-3,9587	0,0179	0,6162 OK
	Abs. return	10-day	~	**Other news**	**- NSI**	YES	0,0000 ***	2,5459	0,0246	0,0000	0,0000 ***	3,9158	0,0191	0,0118
	Abs. return	1-day	~	**Other news**	**OSI** 10	YES	0,0000 ***	5,0111	0,0189	0,0000				
	Abs. return	1-day	~	**Other news**	**+ PSI** 10	YES	0,0000 ***	-2,6468	0,0161	0,0002				
	Abs. return	1-day	~	**Other news**	**- NSI** 10	YES	0,0000 ***	4,6498	0,0621	0,0000				
signif.	**Abs. return**	10-day	~	**Other news**	**OSI** 10	YES	0,0059 **	2,4834	0,0033	0,0004	0,0059 **	3,5728	0,0023	0,1596 OK
signif.	**Abs. return**	10-day	~	**Other news**	**+ PSI** 10	YES	0,0000 ***	-4,5571	0,0342	0,0000	0,0000 ***	-7,6462	0,0317	0,1244 OK
	Abs. return	10-day	~	**Other news**	**- NSI** 10	YES	0,0000 ***	4,8280	0,0478	0,0000	0,0000 ***	7,7936	0,0410	0,0022
signif.	**Abs. return**	1-day	~	**Other news**	**OSI**	NO	0,0394 *	0,7816	0,0024	0,4158 OK				
	Abs. return	1-day	~	**Other news**	**+ PSI**	NO	0,7442	0,0941	0,0001	0,9609 OK				
signif.	**Abs. return**	1-day	~	**Other news**	**- NSI**	NO	0,0113 *	0,6700	0,0036	0,2771 OK				
	Abs. return	10-day	~	**Other news**	**OSI**	NO	0,3687	0,4286	0,0005	0,1258 OK				
	Abs. return	10-day	~	**Other news**	**+ PSI**	NO	0,7177	-0,1309	0,0001	0,1799 OK				
	Abs. return	10-day	~	**Other news**	**- NSI**	NO	0,1209	0,5157	0,0014	0,3543 OK				
	Abs. return	1-day	~	**Other news**	**OSI** 10	NO	0,0000 ***	3,2802	0,0157	0,0003				
	Abs. return	1-day	~	**Other news**	**+ PSI** 10	NO	0,0748	0,7478	0,0018	0,0596 OK				
	Abs. return	1-day	~	**Other news**	**- NSI** 10	NO	0,0000 ***	1,6166	0,0115	0,0035				
signif.	**Abs. return**	10-day	~	**Other news**	**OSI** 10	NO	0,0099 **	2,0133	0,0038	0,1544 OK	0,0099 **	4,1535	0,0037	0,4990 OK
	Abs. return	10-day	~	**Other news**	**+ PSI** 10	NO	0,7593	0,1616	0,0001	0,2624 OK				
signif.	**Abs. return**	10-day	~	**Other news**	**- NSI** 10	NO	0,0075 **	1,2022	0,0040	0,5048 OK				

Table 11: Results from *Absolute return ~ Other news* regression tests

Volume

Other news have the same kind of effects on volume as All news and Money news; with the financial crisis in the dataset, Other news effect especially ten-day trading volume. The results are not that solid when removing financial crisis from the dataset. All results fail in heterosce-dasticity tests when removing the financial crisis. This is the opposite of what happened with Money news.

Regression							Summary				Summary (with the BC transformation)			
	y			x		Financial crisis	P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
	Volume	1-day	~	**Other news**	**OSI**	YES	0,0725	0,4081	0,0014	0,4795 OK				
	Volume	1-day	~	**Other news**	**+ PSI**	YES	0,0000 ***	-1,8841	0,0599	0,0001				
	Volume	1-day	~	**Other news**	**- NSI**	YES	0,0000 ***	2,0334	0,0761	0,0191				
signif.	**Volume**	10-day	~	**Other news**	**OSI**	YES	0,0029 **	0,6156	0,0039	0,5996 OK				
	Volume	10-day	~	**Other news**	**+ PSI**	YES	0,0000 ***	-2,1479	0,0940	0,0000	0,0000 ***	-4,3828	0,0776	0,0000
signif.	**Volume**	10-day	~	**Other news**	**- NSI**	YES	0,0000 ***	2,4546	0,1339	0,0000	0,0000 ***	5,5124	0,1338	0,4207 OK
signif.	**Volume**	1-day	~	**Other news**	**OSI** 10	YES	0,0003 ***	1,4699	0,0057	0,1410 OK				
	Volume	1-day	~	**Other news**	**+ PSI** 10	YES	0,0000 ***	-3,8975	0,1214	0,0000				
	Volume	1-day	~	**Other news**	**- NSI** 10	YES	0,0000 ***	3,7909	0,1431	0,0002				
signif.	**Volume**	10-day	~	**Other news**	**OSI** 10	YES	0,0000 ***	1,5345	0,0074	0,1253 OK				
	Volume	10-day	~	**Other news**	**+ PSI** 10	YES	0,0000 ***	-4,4519	0,1913	0,0000	0,0000 ***	-8,8559	0,1500	0,0000
	Volume	10-day	~	**Other news**	**- NSI** 10	YES	0,0000 ***	4,2554	0,2178	0,0000	0,0000 ***	9,6225	0,2207	0,0062
	Volume	1-day	~	**Other news**	**OSI**	NO	0,0583	0,3807	0,0020	0,1373 OK				
	Volume	1-day	~	**Other news**	**+ PSI**	NO	0,0708	-0,2758	0,0018	0,9623 OK				
	Volume	1-day	~	**Other news**	**- NSI**	NO	0,0000 ***	0,5878	0,0099	0,0291				
	Volume	10-day	~	**Other news**	**OSI**	NO	0,0004 ***	0,5150	0,0071	0,0000	0,0004 ***	1,2219	0,0113	0,0000
	Volume	10-day	~	**Other news**	**+ PSI**	NO	0,0385 *	-0,2286	0,0024	0,0004	0,0385 *	-0,3234	0,0014	0,0013
	Volume	10-day	~	**Other news**	**- NSI**	NO	0,0000 ***	0,6776	0,0252	0,0000				
	Volume	1-day	~	**Other news**	**OSI** 10	NO	0,0004 ***	1,1738	0,0072	0,0017				
	Volume	1-day	~	**Other news**	**+ PSI** 10	NO	0,0610	-0,4169	0,0020	0,0483				
	Volume	1-day	~	**Other news**	**- NSI** 10	NO	0,0000 ***	1,0618	0,0177	0,0460				
	Volume	10-day	~	**Other news**	**OSI** 10	NO	0,0000 ***	1,7454	0,0303	0,0000				
	Volume	10-day	~	**Other news**	**+ PSI** 10	NO	0,4781	-0,1142	0,0003	0,0072				
	Volume	10-day	~	**Other news**	**- NSI** 10	NO	0,0000 ***	1,2218	0,0447	0,0027				

Table 12: Results from *Absolute return ~ Other news* regression tests

Volatility

With the financial crisis in the dataset, most results seem to be statistically highly significant (0.1% significance), but heteroscedastic. Applying the BC transformation removes heteroscedasticity from OSI and PSI regressions. After eliminating the financial crisis from the dataset, the results state that especially Other news NSI and NSI_{10} have small but statistically very significant (0.1% significance) positive effects on volatility.

Regression							Summary				Summary (with the BC transformation)			
	y			x		Financial crisis	P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
signif.	**Volatility**	1-day	~	**Other news**	**OSI**	YES	0,0000 ***	2,0909	0,0093	0,0067	0,0000 ***	3,3354	0,0098	0,7210 OK
signif.	**Volatility**	1-day	~	**Other news**	**+ PSI**	YES	0,0000 ***	-2,3921	0,0241	0,0137	0,0000 ***	-3,9801	0,0275	0,0551 OK
	Volatility	1-day	~	**Other news**	**- NSI**	YES	0,0000 ***	4,0105	0,0739	0,0000	0,0000 ***	6,5424	0,0811	0,0191
	Volatility	1-day	~	**Other news**	**OSI** 10	YES	0,0000 ***	7,5839	0,0376	0,0000	0,0000 ***	12,1303	0,0397	0,0190
	Volatility	1-day	~	**Other news**	**+ PSI** 10	YES	0,0000 ***	-4,7798	0,0456	0,0001	0,0000 ***	-7,8468	0,0507	0,0127
	Volatility	1-day	~	**Other news**	**- NSI** 10	YES	0,0000 ***	7,6390	0,1451	0,0000	0,0000 ***	12,3753	0,1571	0,0000
signif.	**Volatility**	1-day	~	**Other news**	**OSI**	NO	0,0002 ***	1,4542	0,0079	0,3690 OK				
	Volatility	1-day	~	**Other news**	**+ PSI**	NO	0,7917	0,0782	0,0000	0,4914 OK				
signif.	**Volatility**	1-day	~	**Other news**	**- NSI**	NO	0,0000 ***	1,3254	0,0134	0,5492 OK				
signif.	**Volatility**	1-day	~	**Other news**	**OSI** 10	NO	0,0000 ***	5,3783	0,0401	0,0862 OK	0,0000 ***	11,9243	0,0503	0,9816 OK
signif.	**Volatility**	1-day	~	**Other news**	**+ PSI** 10	NO	0,0342 *	0,9130	0,0025	0,2694 OK	0,0342 *	1,7572	0,0024	0,6052 OK
signif.	**Volatility**	1-day	~	**Other news**	**- NSI** 10	NO	0,0000 ***	2,8718	0,0344	0,1201 OK	0,0000 ***	6,5556	0,0458	0,8590 OK

Table 13: Results from *Volatility ~ Other news* regression tests

Conclusions

When comparing how All news, Money news, and Other news predict returns, the results differ by a surprisingly large proportion. After the financial crisis, all have some predictability, but the effects are in opposite directions. Negative sentiment on Money news seems to have positive impact on returns, but Positive sentiment on Other news appears to have a negative impact on returns. This is somewhat unexpected but still intuitive: when Other news are positive, companies don't pay that much attention to the business side, but when Money news are negative, companies have to push it. This could be due to the underreaction-overreaction model that Barberis Shleifer and Vishny (1998) introduced. Of course, I'm not suggesting that this kind of results could, with absolute certainty, be drawn from short-term data, but they still follow some basic ideas of psychology.

Money news is a clear winner when it comes to predicting absolute returns, but all categories work in the same direction: high negative sentiment predicts high absolute returns. Positive sentiment in any of the categories doesn't seem to have anything to do with absolute returns whatsoever.

When predicting volume, Other news and All news seem to be suffering from high heteroscedasticity, while especially positive Money news seem to have a clear negative effect on volume. In Money news, negative sentiment doesn't seem to have any effect on volume, when again in Other news, the effect is completely different: negative sentiment in Other news has a clear positive effect on volume.

Results state that news sentiment has a clear effect on volatility as well. Here the effect is to the same direction, with both, Money and Other news and this can be seen in All news results: All news sentiment has much more impact on volatility than Money news and Other news. Here again, we can see that positive sentiment doesn't have an impact on volatility, but the negative sentiment does.

The results are in line with theory and prove that Money news and Other news differ regarding the direction of the effect. The tests also showed that measuring online news sentiments offers a high-frequency and statistically very significant way of predicting high market activities. It is very promising for the future research that all news article subsets – not only financial news – offered substantial input in predicting high market activities. The results on predicting returns were not that good, but some exceptions offered new viewpoints for future research, especially the effect of negative sentiments, which was present in all the tests. These results are well in line with the existing research and are consistent with those of Antweiler and Frank (2004) and Harris and Raviv (1993,) namely, that negativity is associated with an increased trading volume.

References

Antweiler, W. and M. Z. Frank, 2004, Is all that talk just noise? the information content of internet stock message boards, *Journal of Finance* 59, 1259–1293.

Baccianella, S., Esuli, A. and Sebastiani, F., 2010, SentiWordNet 3.0: An Enhanced Lexical Resource for Sentiment Analysis and Opinion Mining, *LREC* 10.

Baker, M. and J. Wurgler, 2006, Investor sentiment and the cross-section of stock returns, *Journal of Finance* 61, 1645–1680.

Barberis, N., A. Shleifer and R. Vishny, 1998, A model of investor sentiment, *Journal of Financial Economics* 49, 307–343.

Bollen, J., H. Mao, and X. Zeng, 2011, Twitter mood predicts the stock market, *Journal of Computational Science* 2, 1, 1–8.

Box, G. E., and Cox, D. R., 1964, An analysis of transformations, *Journal of the Royal Statistical Society. Series B (Methodological)*, 211-252.

Campbell, J., S. J. Grossman, and J.Wang, 1993, Trading volume and serial correlation in stock returns, *Quarterly Journal of Economics* 108, 4, 905–939.

De Long, J. B., A. Shleifer, L. H. Summers, and R. J. Waldmann, 1990, Noise trader risk in financial markets, *Journal of Political Economy* 98, 703–738.

Edmans, A., D. Garcia, and O. Norli, 2007, Sports sentiment and stock returns, *Journal of Finance* 62, 1967–1998.

Esuli, A., & Sebastiani, F., 2007, SentiWordNet: a high-coverage lexical resource for opinion mining, *Evaluation*, 1-26.

Fama, E. F., 1970, Efficient capital markets: A review of theory and empirical work, *Journal of Finance* 25, 2, 3, 83–417.

Kahneman, D., 1973, Attention and Effort Prentice-Hall, Englewood Cliffs, New Jersey.

Keynes, J. M., 1936, The General Theory of Employment, Interest, and Money, *MacMillan*, London.

Lee, C., A. Shleifer, and R. Thaler, 1991, Investors sentiment and the closed-end fund puzzle, *Journal of Finance* 46, 75–109.

Li, F., 2006, Annual report readability, current earnings, and earnings persistence, *Journal of Accounting and Economics* 45, 2008, 221–247.

Malkiel, B.G., 2003 The efficient market hypothesis and its critics, *The Journal of Economic Perspectives* 17, 3, 59-82.

Manela, A. and Moreira, A., 2015, News implied volatility and disaster concerns, *Journal of Financial Economics* 123, 137–162.

Mayer-Schönberger, V., and Cukier, K., 2014, Big Data: A Revolution That Will Transform How We Live, Work, and Think, *Houghton Mifflin Harcourt*, New York.

Miller, G. A., 1995, WordNet: a lexical database for English, *Communications of the ACM* 38, 11, 39-41.

Neal, R. and Wheatley, S. M., 1998, Do measures of investor sentiment predict returns? *Journal of Financial and Quantitative Analysis* 33, 523–545.

Pilger, J, 1998, Hidden Agendas, *Vintage*, London, 440.

Sakia, R.M., 1992, The Box-Cox Transformation Technique: A Review Journal of the Royal Statistical Society, *Journal of the Royal Statistical Society. Series D (The Statistician)* 41, 2, 169-178.

Tetlock, P., 2007, Giving content to investor sentiment: The role of media in the stock market, *Journal of Finance* 62, 1139–1168.

Tetlock, P., M. Saar-Tsechansky, and S. Mackassy, 2008, More than words: Quantifying lan-

guage to measure firms' fundamentals, *Journal of Finance* 63, 1437–1467.

Vargiu, E., & Urru, M., 2012, Exploiting web scraping in a collaborative filtering-based approach to web advertising, *Artificial Intelligence Research*, 2, 1, 44.

Online references

Daily Mail Online [Online]. Available: http://www.dailymail.co.uk/. Accessed for the first time: 26.9.2017.

Internet Live Stats [Online]. Available: http://www.internetlivestats.com/internet-users/. Accessed: 15.11.2017.

Newspaper ABCs: Digital statistics for January 2014 [Online]. Available: https://archive.is/20140224224124/http://www.brandrepublic.com/news/1281725/ABCs-digital-Statistics-January-2014/. Accessed: 15.11.2017.

SimilarWeb DailyMail.co.uk analytics [Online]. Available: https://www.similarweb.com/website/dailymail.co.uk. Accessed: 1.12.2017.

Wheeler, B., 2012, How the Daily Mail stormed the US, *BBC News*, Washington. [Online]. Available: http://www.bbc.com/news/magazine-16746785. Accessed: 15.11.2017.

Table 12: Summary table of all regression test results

Regression								Financial crisis	Summary				Summary (with the BC transformation)			
	y			x					P-value	Estimate	R-squared	Breusch-Pagan	P-value	Estimate	R-squared	Breusch-Pagan
	Return	1-day	~	**All news**	**OSI**			YES	0,8156	-0,0041	0,0000	0,0004				
	Return	1-day	~	**All news**	+ **PSI**			YES	0,5715	-0,0062	0,0001	0,0036				
	Return	1-day	~	**All news**	- **NSI**			YES	0,8585	0,0022	0,0000	0,0000				
	Return	10-day	~	**All news**	**OSI**			YES	0,1081	-0,0780	0,0011	0,0193				
	Return	10-day	~	**All news**	+ **PSI**			YES	0,2559	-0,0345	0,0006	0,0000				
	Return	10-day	~	**All news**	- **NSI**			YES	0,5889	-0,0189	0,0001	0,0000				
	Return	1-day	~	**All news**	**OSI**	10		YES	0,5242	0,0207	0,0002	0,0000				
	Return	1-day	~	**All news**	+ **PSI**	10		YES	0,8298	0,0032	0,0000	0,0000				
	Return	1-day	~	**All news**	- **NSI**	10		YES	0,6569	0,0080	0,0001	0,0000				
	Return	10-day	~	**All news**	**OSI**	10		YES	0,4361	-0,0701	0,0003	0,0001				
	Return	10-day	~	**All news**	+ **PSI**	10		YES	0,3307	-0,0400	0,0004	0,0000				
	Return	10-day	~	**All news**	- **NSI**	10		YES	0,7786	0,0141	0,0000	0,0000				
	Return	1-day	~	**All news**	**OSI**			NO	0,5420	0,0100	0,0002	0,0946 OK				
	Return	1-day	~	**All news**	+ **PSI**			NO	0,3307	0,0100	0,0005	0,4168 OK				
	Return	1-day	~	**All news**	- **NSI**			NO	0,3173	0,0121	0,0006	0,0002				
	Return	10-day	~	**All news**	**OSI**			NO	0,0897	-0,0802	0,0016	0,2509 OK				
signif.	**Return**	10-day	~	**All news**	+ **PSI**			NO	0,0218 *	-0,0676	0,0030	0,7864 OK				
	Return	10-day	~	**All news**	- **NSI**			NO	0,9567	0,0019	0,0000	0,0178				
	Return	1-day	~	**All news**	**OSI**	10		NO	0,4742	0,0202	0,0003	0,0000				
	Return	1-day	~	**All news**	+ **PSI**	10		NO	0,4100	0,0112	0,0004	0,8864 OK				
	Return	1-day	~	**All news**	- **NSI**	10		NO	0,8814	-0,0026	0,0000	0,0000				
	Return	10-day	~	**All news**	**OSI**	10		NO	0,9799	0,0020	0,0000	0,4386 OK				
signif.	**Return**	10-day	~	**All news**	+ **PSI**	10		NO	0,0317 *	-0,0838	0,0026	0,3883 OK				
signif.	**Return**	10-day	~	**All news**	- **NSI**	10		NO	0,0069 **	0,1375	0,0041	0,0984 OK				
	Abs. return	1-day	~	**All news**	**OSI**			YES	0,0005 ***	1,6865	0,0053	0,0014				
	Abs. return	1-day	~	**All news**	+ **PSI**			YES	0,0000 ***	-1,2725	0,0077	0,0454				
	Abs. return	1-day	~	**All news**	- **NSI**			YES	0,0000 ***	3,3657	0,0409	0,0000				
	Abs. return	10-day	~	**All news**	**OSI**			YES	0,0695	1,0433	0,0014	0,0204				
signif.	**Abs. return**	10-day	~	**All news**	+ **PSI**			YES	0,0000 ***	-2,2012	0,0165	0,0027	0,0000 ***	-3,7279	0,0156	0,1821 OK
	Abs. return	10-day	~	**All news**	- **NSI**			YES	0,0000 ***	3,6497	0,0344	0,0000	0,0000 ***	5,7124	0,0277	0,0032
	Abs. return	1-day	~	**All news**	**OSI**	10		YES	0,0000 ***	5,5386	0,0166	0,0000				
	Abs. return	1-day	~	**All news**	+ **PSI**	10		YES	0,0000 ***	-2,4993	0,0162	0,0005				
	Abs. return	1-day	~	**All news**	- **NSI**	10		YES	0,0000 ***	6,9112	0,0831	0,0000				
	Abs. return	10-day	~	**All news**	**OSI**	10		YES	0,0070 **	2,8699	0,0032	0,0000	0,0070 **	2,9389	0,0011	0,0108
signif.	**Abs. return**	10-day	~	**All news**	+ **PSI**	10		YES	0,0000 ***	-3,9840	0,0294	0,0002	0,0000 ***	-6,9057	0,0291	0,4946 OK
	Abs. return	10-day	~	**All news**	- **NSI**	10		YES	0,0000 ***	7,3931	0,0680	0,0000	0,0000 ***	11,5771	0,0549	0,0001

	Abs. return	1-day	~	**All news**	**OSI**	NO	0,0601		0,8010	0,0020	0,1842	OK				
	Abs. return	1-day	~	**All news**	+ **PSI**	NO	0,4136		-0,2176	0,0004	0,5695	OK				
	Abs. return	1-day	~	**All news**	- **NSI**	NO	0,0000	***	1,4272	0,0117	0,0142					
	Abs. return	10-day	~	**All news**	**OSI**	NO	0,2142		0,6649	0,0009	0,4991	OK				
	Abs. return	10-day	~	**All news**	+ **PSI**	NO	0,3523		-0,3110	0,0005	0,9850	OK				
signif.	**Abs. return**	10-day	~	**All news**	- **NSI**	NO	0,0043	**	1,1231	0,0046	0,0983	OK	0,0043	**	2,4137	0,0049	0,7012	OK
	Abs. return	1-day	~	**All news**	**OSI** 10	NO	0,0000	***	3,3684	0,0119	0,0024					
	Abs. return	1-day	~	**All news**	+ **PSI** 10	NO	0,6724		-0,1489	0,0001	0,8830	OK				
	Abs. return	1-day	~	**All news**	- **NSI** 10	NO	0,0000	***	2,8162	0,0212	0,0000					
	Abs. return	10-day	~	**All news**	**OSI** 10	NO	0,1642		1,2832	0,0011	0,9184	OK				
	Abs. return	10-day	~	**All news**	+ **PSI** 10	NO	0,2042		-0,5615	0,0009	0,6841	OK				
signif.	**Abs. return**	10-day	~	**All news**	- **NSI** 10	NO	0,0010	**	1,8914	0,0061	0,3634	OK	0,0010	**	4,6344	0,0083	0,5124	OK
	Volume	1-day	~	**All news**	**OSI**	YES	0,9322		-0,0222	0,0000	0,1675	OK				
	Volume	1-day	~	**All news**	+ **PSI**	YES	0,0000	***	-1,8641	0,0574	0,0000					
signif.	**Volume**	1-day	~	**All news**	- **NSI**	YES	0,0000	***	2,4055	0,0724	0,1080	OK				
	Volume	10-day	~	**All news**	**OSI**	YES	0,2272		0,2868	0,0006	0,5566	OK				
	Volume	10-day	~	**All news**	+ **PSI**	YES	0,0000	***	-2,0275	0,0820	0,0000		0,0000	***	-4,2337	0,0709	0,0000	
signif.	**Volume**	10-day	~	**All news**	- **NSI**	YES	0,0000	***	2,8204	0,1203	0,0000		0,0000	***	6,1871	0,1147	0,6144	OK
	Volume	1-day	~	**All news**	**OSI** 10	YES	0,1332		0,7261	0,0010	0,5234	OK				
	Volume	1-day	~	**All news**	+ **PSI** 10	YES	0,0000	***	-3,1808	0,0910	0,0000					
	Volume	1-day	~	**All news**	- **NSI** 10	YES	0,0000	***	4,9508	0,1480	0,0000					
signif.	**Volume**	10-day	~	**All news**	**OSI** 10	YES	0,0226	*	1,0031	0,0023	0,1141	OK				
	Volume	10-day	~	**All news**	+ **PSI** 10	YES	0,0000	***	-3,6148	0,1420	0,0000		0,0000	***	-7,4538	0,1197	0,0000	
	Volume	10-day	~	**All news**	- **NSI** 10	YES	0,0000	***	5,7345	0,2399	0,0000		0,0000	***	12,5140	0,2264	0,0005	
	Volume	1-day	~	**All news**	**OSI**	NO	0,8771		0,0349	0,0000	0,0119					
	Volume	1-day	~	**All news**	+ **PSI**	NO	0,0001	***	-0,5595	0,0089	0,0440					
	Volume	1-day	~	**All news**	- **NSI**	NO	0,0000	***	0,7606	0,0118	0,0070					
	Volume	10-day	~	**All news**	**OSI**	NO	0,5298		0,1027	0,0002	0,0000					
	Volume	10-day	~	**All news**	+ **PSI**	NO	0,0000	***	-0,4732	0,0122	0,0000		0,0000	***	-0,7565	0,0088	0,0000	
	Volume	10-day	~	**All news**	- **NSI**	NO	0,0000	***	0,7399	0,0214	0,0001					
	Volume	1-day	~	**All news**	**OSI** 10	NO	0,4205		0,3136	0,0004	0,0007					
signif.	**Volume**	1-day	~	**All news**	+ **PSI** 10	NO	0,0002	***	-0,6942	0,0078	0,0624	OK				
signif.	**Volume**	1-day	~	**All news**	- **NSI** 10	NO	0,0000	***	1,3654	0,0178	0,0672	OK				
	Volume	10-day	~	**All news**	**OSI** 10	NO	0,0063	**	0,7683	0,0042	0,0000					
	Volume	10-day	~	**All news**	+ **PSI** 10	NO	0,0000	***	-0,6148	0,0117	0,0009					
	Volume	10-day	~	**All news**	- **NSI** 10	NO	0,0000	***	1,5842	0,0457	0,0370					
signif.	**Volatility**	1-day	~	**All news**	**OSI**	YES	0,0002	***	1,9477	0,0061	0,0242		0,0002	***	3,2304	0,0069	0,6758	OK
	Volatility	1-day	~	**All news**	+ **PSI**	YES	0,0000	***	-2,6265	0,0285	0,0028		0,0000	***	-4,3636	0,0324	0,0369	
	Volatility	1-day	~	**All news**	- **NSI**	YES	0,0000	***	5,1561	0,0831	0,0000		0,0000	***	8,5176	0,0936	0,0153	

	Volatility	1-day	~	**All news**		**OSI**	10	YES	0,0000	***	7,2190	0,0245	0,0000		0,0000	***	10,9634	0,0233	0,0175	
signif.	**Volatility**	1-day	~	**All news**	+	**PSI**	10	YES	0,0000	***	-4,5904	0,0474	0,0001		0,0000	***	-7,6493	0,0542	0,0786	OK
	Volatility	1-day	~	**All news**	-	**NSI**	10	YES	0,0000	***	10,8977	0,1791	0,0000		0,0000	***	17,5111	0,1908	0,0000	
signif.	**Volatility**	1-day	~	**All news**		**OSI**		NO	0,0103	*	1,1223	0,0037	0,3552	OK						
signif.	**Volatility**	1-day	~	**All news**	+	**PSI**		NO	0,0080	**	-0,7241	0,0040	0,0617	OK	0,0080	**	-1,1739	0,0027	0,1334	OK
signif.	**Volatility**	1-day	~	**All news**	-	**NSI**		NO	0,0000	***	2,1061	0,0242	0,3087	OK	0,0000	***	4,8197	0,0323	0,7573	OK
signif.	**Volatility**	1-day	~	**All news**		**OSI**	10	NO	0,0000	***	4,4286	0,0195	0,3368	OK	0,0000	***	10,1539	0,0262	0,4258	OK
	Volatility	1-day	~	**All news**	+	**PSI**	10	NO	0,0512		-0,7050	0,0021	0,4412	OK						
signif.	**Volatility**	1-day	~	**All news**	-	**NSI**	10	NO	0,0000	***	4,5284	0,0520	0,0138		0,0000	***	9,9619	0,0643	0,1776	OK
	Return	1-day	~	**Money news**		**OSI**		YES	0,0883		0,0089	0,0013	0,0000							
	Return	1-day	~	**Money news**	+	**PSI**		YES	0,3328		0,0046	0,0004	0,0444							
	Return	1-day	~	**Money news**	-	**NSI**		YES	0,0606		0,0080	0,0015	0,0000							
	Return	10-day	~	**Money news**		**OSI**		YES	0,7012		0,0055	0,0001	0,0000							
	Return	10-day	~	**Money news**	+	**PSI**		YES	0,7078		0,0049	0,0001	0,7616	OK						
	Return	10-day	~	**Money news**	-	**NSI**		YES	0,7673		0,0035	0,0000	0,0000							
	Return	1-day	~	**Money news**		**OSI**	10	YES	0,8980		0,0009	0,0000	0,0000							
	Return	1-day	~	**Money news**	+	**PSI**	10	YES	0,8671		-0,0015	0,0000	0,1215	OK						
	Return	1-day	~	**Money news**	-	**NSI**	10	YES	0,7729		0,0016	0,0000	0,0000							
	Return	10-day	~	**Money news**		**OSI**	10	YES	0,5404		0,0126	0,0002	0,0000							
	Return	10-day	~	**Money news**	+	**PSI**	10	YES	0,4495		0,0184	0,0003	0,0097							
	Return	10-day	~	**Money news**	-	**NSI**	10	YES	0,6565		0,0069	0,0001	0,0000							
	Return	1-day	~	**Money news**		**OSI**		NO	0,0230	*	0,0102	0,0029	0,0010							
signif.	**Return**	1-day	~	**Money news**	+	**PSI**		NO	0,0223	*	0,0092	0,0029	0,7017	OK						
	Return	1-day	~	**Money news**	-	**NSI**		NO	0,0865		0,0065	0,0017	0,0000							
	Return	10-day	~	**Money news**		**OSI**		NO	0,1121		0,0206	0,0014	0,1859	OK						
	Return	10-day	~	**Money news**	+	**PSI**		NO	0,8889		0,0016	0,0000	0,0745	OK						
	Return	10-day	~	**Money news**	-	**NSI**		NO	0,0149	*	0,0267	0,0033	0,0003							
	Return	1-day	~	**Money news**		**OSI**	10	NO	0,5871		-0,0035	0,0002	0,0009							
	Return	1-day	~	**Money news**	+	**PSI**	10	NO	0,9445		-0,0005	0,0000	0,5871	OK						
	Return	1-day	~	**Money news**	-	**NSI**	10	NO	0,4364		-0,0040	0,0003	0,0000							
signif.	**Return**	10-day	~	**Money news**		**OSI**	10	NO	0,0169	*	0,0448	0,0032	0,0731	OK						
	Return	10-day	~	**Money news**	+	**PSI**	10	NO	0,4935		0,0145	0,0003	0,9107	OK						
	Return	10-day	~	**Money news**	-	**NSI**	10	NO	0,0015	**	0,0466	0,0057	0,0052							
	Abs. return	1-day	~	**Money news**		**OSI**		YES	0,0000	***	1,1130	0,0261	0,0000							
signif.	**Abs. return**	1-day	~	**Money news**	+	**PSI**		YES	0,0136	*	0,3252	0,0027	0,0800	OK						
	Abs. return	1-day	~	**Money news**	-	**NSI**		YES	0,0000	***	1,1924	0,0442	0,0000							
	Abs. return	10-day	~	**Money news**		**OSI**		YES	0,0000	***	1,2600	0,0239	0,0001		0,0000	***	2,1610	0,0231	0,0313	
	Abs. return	10-day	~	**Money news**	+	**PSI**		YES	0,4098		0,1286	0,0003	0,9769	OK						
	Abs. return	10-day	~	**Money news**	-	**NSI**		YES	0,0000	***	1,5245	0,0516	0,0000		0,0000	***	2,5376	0,0471	0,0011	

	Abs. return	1-day	~	**Money news**	**OSI**	10	YES	0,0000	***	1,9339	0,0390	0,0000					
signif.	**Abs. return**	1-day	~	**Money news**	+ **PSI**	10	YES	0,0130	*	0,6034	0,0027	0,2001	OK				
	Abs. return	1-day	~	**Money news**	- **NSI**	10	YES	0,0000	***	1,9166	0,0669	0,0000					
	Abs. return	10-day	~	**Money news**	**OSI**	10	YES	0,0000	***	2,5214	0,0475	0,0000		0,0000	***	4,1996	0,0433	0,0003	
signif.	**Abs. return**	10-day	~	**Money news**	+ **PSI**	10	YES	0,0001	***	1,0923	0,0064	0,0313		0,0001	***	2,0372	0,0073	0,0878	OK
	Abs. return	10-day	~	**Money news**	- **NSI**	10	YES	0,0000	***	2,3817	0,0739	0,0000		0,0000	***	3,8832	0,0646	0,0001	
	Abs. return	1-day	~	**Money news**	**OSI**		NO	0,0001	***	0,4632	0,0089	0,0177							
	Abs. return	1-day	~	**Money news**	+ **PSI**		NO	0,5330		0,0652	0,0002	0,9909	OK						
	Abs. return	1-day	~	**Money news**	- **NSI**		NO	0,0000	***	0,5784	0,0193	0,0004							
signif.	**Abs. return**	10-day	~	**Money news**	**OSI**		NO	0,0050	**	0,4109	0,0044	0,6795	OK						
	Abs. return	10-day	~	**Money news**	+ **PSI**		NO	0,3102		-0,1333	0,0006	0,0304							
signif.	**Abs. return**	10-day	~	**Money news**	- **NSI**		NO	0,0000	***	0,6665	0,0163	0,0160		0,0000	***	1,3875	0,0161	0,6378	OK
	Abs. return	1-day	~	**Money news**	**OSI**	10	NO	0,0000	***	0,7359	0,0107	0,0118							
	Abs. return	1-day	~	**Money news**	+ **PSI**	10	NO	0,8390		0,0389	0,0000	0,2963	OK						
	Abs. return	1-day	~	**Money news**	- **NSI**	10	NO	0,0000	***	0,8557	0,0236	0,0000							
signif.	**Abs. return**	10-day	~	**Money news**	**OSI**	10	NO	0,0002	***	0,8025	0,0081	0,2534	OK	0,0002	***	1,7952	0,0092	0,6300	OK
	Abs. return	10-day	~	**Money news**	+ **PSI**	10	NO	0,4207		0,1935	0,0004	0,5475	OK						
signif.	**Abs. return**	10-day	~	**Money news**	- **NSI**	10	NO	0,0000	***	0,8652	0,0153	0,0539	OK	0,0000	***	1,8588	0,0161	0,5715	OK
	Volume	1-day	~	**Money news**	**OSI**		YES	0,0000	***	0,6167	0,0278	0,0000							
	Volume	1-day	~	**Money news**	+ **PSI**		YES	0,0946		0,1184	0,0012	0,0116							
	Volume	1-day	~	**Money news**	- **NSI**		YES	0,0000	***	0,7057	0,0536	0,0000							
	Volume	10-day	~	**Money news**	**OSI**		YES	0,0000	***	0,6999	0,0432	0,0000		0,0000	***	1,3154	0,0302	0,0000	
	Volume	10-day	~	**Money news**	+ **PSI**		YES	0,0041	**	0,1847	0,0036	0,0006							
	Volume	10-day	~	**Money news**	- **NSI**		YES	0,0000	***	0,7642	0,0760	0,0000		0,0000	***	1,4941	0,0576	0,0000	
	Volume	1-day	~	**Money news**	**OSI**	10	YES	0,0000	***	1,1946	0,0517	0,0001							
	Volume	1-day	~	**Money news**	+ **PSI**	10	YES	0,0002	***	0,4879	0,0061	0,0161							
	Volume	1-day	~	**Money news**	- **NSI**	10	YES	0,0000	***	1,1398	0,0821	0,0000							
	Volume	10-day	~	**Money news**	**OSI**	10	YES	0,0000	***	1,3697	0,0821	0,0000		0,0000	***	2,5693	0,0572	0,0000	
	Volume	10-day	~	**Money news**	+ **PSI**	10	YES	0,0000	***	0,5105	0,0081	0,0000							
	Volume	10-day	~	**Money news**	- **NSI**	10	YES	0,0000	***	1,3256	0,1341	0,0000		0,0000	***	2,5768	0,1004	0,0000	
	Volume	1-day	~	**Money news**	**OSI**		NO	0,2489		-0,0714	0,0008	0,8582	OK						
signif.	**Volume**	1-day	~	**Money news**	+ **PSI**		NO	0,0001	***	-0,2177	0,0087	0,7268	OK						
	Volume	1-day	~	**Money news**	- **NSI**		NO	0,1396		0,0775	0,0012	0,6781	OK						
signif.	**Volume**	10-day	~	**Money news**	**OSI**		NO	0,0234	*	-0,1014	0,0029	0,3285	OK	0,0234	*	-0,1931	0,0030	0,5133	OK
signif.	**Volume**	10-day	~	**Money news**	+ **PSI**		NO	0,0000	***	-0,1887	0,0125	0,0624	OK	0,0000	***	-0,3489	0,0121	0,4959	OK
	Volume	10-day	~	**Money news**	- **NSI**		NO	0,7275		0,0132	0,0001	0,7310	OK						
signif.	**Volume**	1-day	~	**Money news**	**OSI**	10	NO	0,0459	*	-0,1790	0,0023	0,2264	OK						
signif.	**Volume**	1-day	~	**Money news**	+ **PSI**	10	NO	0,0000	***	-0,5254	0,0152	0,0760	OK						
	Volume	1-day	~	**Money news**	- **NSI**	10	NO	0,7345		0,0238	0,0001	0,3471	OK						

signif.	**Volume**	10-day	~	**Money news**	**OSI** 10	NO	0,0002 ***	-0,2455	0,0081	0,2736 OK					
signif.	**Volume**	10-day	~	**Money news**	+ **PSI** 10	NO	0,0000 ***	-0,6267	0,0413	0,0006	0,0000 ***	-1,1730	0,0408	0,0845 OK	
	Volume	10-day	~	**Money news**	- **NSI** 10	NO	0,8522	-0,0095	0,0000	0,4066 OK					
	Volatility	1-day	~	**Money news**	**OSI**	YES	0,0000 ***	1,7027	0,0529	0,0000	0,0000 ***	2,9538	0,0656	0,0000	
signif.	**Volatility**	1-day	~	**Money news**	+ **PSI**	YES	0,0021 **	0,4354	0,0042	0,0793 OK	0,0021 **	0,8102	0,0059	0,3921 OK	
	Volatility	1-day	~	**Money news**	- **NSI**	YES	0,0000 ***	1,8694	0,0940	0,0000	0,0000 ***	3,2029	0,1139	0,0000	
	Volatility	1-day	~	**Money news**	**OSI** 10	YES	0,0000 ***	3,0929	0,0865	0,0000	0,0000 ***	5,4855	0,1123	0,0000	
signif.	**Volatility**	1-day	~	**Money news**	+ **PSI** 10	YES	0,0001 ***	1,0225	0,0067	0,2887 OK	0,0001 ***	2,2937	0,0140	0,5243 OK	
	Volatility	1-day	~	**Money news**	- **NSI** 10	YES	0,0000 ***	3,0432	0,1462	0,0000	0,0000 ***	5,2132	0,1770	0,0001	
signif.	**Volatility**	1-day	~	**Money news**	**OSI**	NO	0,0000 ***	0,6683	0,0176	0,0977 OK	0,0000 ***	1,4803	0,0220	0,1844 OK	
	Volatility	1-day	~	**Money news**	+ **PSI**	NO	0,6533	0,0483	0,0001	0,6563 OK					
	Volatility	1-day	~	**Money news**	- **NSI**	NO	0,0000 ***	0,8712	0,0415	0,0083	0,0000 ***	1,8411	0,0474	0,0418	
signif.	**Volatility**	1-day	~	**Money news**	**OSI** 10	NO	0,0000 ***	1,0417	0,0203	0,3574 OK	0,0000 ***	2,5343	0,0307	0,3937 OK	
	Volatility	1-day	~	**Money news**	+ **PSI** 10	NO	0,7175	-0,0711	0,0001	0,0209					
signif.	**Volatility**	1-day	~	**Money news**	- **NSI** 10	NO	0,0000 ***	1,2680	0,0491	0,0261	0,0000 ***	2,8208	0,0622	0,0886 OK	
	Return	1-day	~	**Other news**	**OSI**	YES	0,5139	-0,0100	0,0002	0,0008					
	Return	1-day	~	**Other news**	+ **PSI**	YES	0,7070	-0,0041	0,0001	0,0010					
	Return	1-day	~	**Other news**	- **NSI**	YES	0,5995	-0,0054	0,0001	0,0000					
	Return	10-day	~	**Other news**	**OSI**	YES	0,1088	-0,0678	0,0011	0,0203					
	Return	10-day	~	**Other news**	+ **PSI**	YES	0,0431 *	-0,0608	0,0018	0,0000					
	Return	10-day	~	**Other news**	- **NSI**	YES	0,7816	-0,0080	0,0000	0,0000					
	Return	1-day	~	**Other news**	**OSI** 10	YES	0,4511	0,0207	0,0002	0,0000					
	Return	1-day	~	**Other news**	+ **PSI** 10	YES	0,6213	0,0078	0,0001	0,0000					
	Return	1-day	~	**Other news**	- **NSI** 10	YES	0,7402	0,0047	0,0000	0,0000					
	Return	10-day	~	**Other news**	**OSI** 10	YES	0,6687	-0,0327	0,0001	0,0006					
	Return	10-day	~	**Other news**	+ **PSI** 10	YES	0,1448	-0,0637	0,0009	0,0000					
	Return	10-day	~	**Other news**	- **NSI** 10	YES	0,4044	0,0326	0,0003	0,0000					
	Return	1-day	~	**Other news**	**OSI**	NO	0,3512	0,0136	0,0005	0,1339 OK					
	Return	1-day	~	**Other news**	+ **PSI**	NO	0,3715	0,0099	0,0005	0,8749 OK					
	Return	1-day	~	**Other news**	- **NSI**	NO	0,6270	0,0050	0,0001	0,0571 OK					
signif.	**Return**	10-day	~	**Other news**	**OSI**	NO	0,0023 **	-0,1282	0,0052	0,1352 OK					
signif.	**Return**	10-day	~	**Other news**	+ **PSI**	NO	0,0002 ***	-0,1206	0,0081	0,4644 OK					
	Return	10-day	~	**Other news**	- **NSI**	NO	0,4042	-0,0245	0,0004	0,1627 OK					
	Return	1-day	~	**Other news**	**OSI** 10	NO	0,1993	0,0307	0,0009	0,0000					
	Return	1-day	~	**Other news**	+ **PSI** 10	NO	0,1362	0,0241	0,0013	0,0473					
	Return	1-day	~	**Other news**	- **NSI** 10	NO	0,8229	0,0031	0,0000	0,0001					
	Return	10-day	~	**Other news**	**OSI** 10	NO	0,1110	-0,1099	0,0014	0,0205					
signif.	**Return**	10-day	~	**Other news**	+ **PSI** 10	NO	0,0000 ***	-0,1963	0,0101	0,3811 OK					
	Return	10-day	~	**Other news**	- **NSI** 10	NO	0,0931	0,0667	0,0016	0,1616 OK					

	Abs. return	1-day	~	**Other news**	**OSI**	YES	0,0009	***	1,4057	0,0049	0,0038				
	Abs. return	1-day	~	**Other news**	**+ PSI**	YES	0,0000	***	-1,2993	0,0082	0,0191				
	Abs. return	1-day	~	**Other news**	**- NSI**	YES	0,0000	***	2,4237	0,0312	0,0000				
	Abs. return	10-day	~	**Other news**	**OSI**	YES	0,2102		0,6274	0,0007	0,0078				
signif.	**Abs. return**	10-day	~	**Other news**	**+ PSI**	YES	0,0000	***	-2,2392	0,0174	0,0193	0,0000	***	-3,9587	0,0179	0,6162	OK
	Abs. return	10-day	~	**Other news**	**- NSI**	YES	0,0000	***	2,5459	0,0246	0,0000	0,0000	***	3,9158	0,0191	0,0118	
	Abs. return	1-day	~	**Other news**	**OSI** 10	YES	0,0000	***	5,0111	0,0189	0,0000				
	Abs. return	1-day	~	**Other news**	**+ PSI** 10	YES	0,0000	***	-2,6468	0,0161	0,0002				
	Abs. return	1-day	~	**Other news**	**- NSI** 10	YES	0,0000	***	4,6498	0,0621	0,0000				
signif.	**Abs. return**	10-day	~	**Other news**	**OSI** 10	YES	0,0059	**	2,4834	0,0033	0,0004	0,0059	**	3,5728	0,0023	0,1596	OK
signif.	**Abs. return**	10-day	~	**Other news**	**+ PSI** 10	YES	0,0000	***	-4,5571	0,0342	0,0000	0,0000	***	-7,6462	0,0317	0,1244	OK
	Abs. return	10-day	~	**Other news**	**- NSI** 10	YES	0,0000	***	4,8280	0,0478	0,0000	0,0000	***	7,7936	0,0410	0,0022	
signif.	**Abs. return**	1-day	~	**Other news**	**OSI**	NO	0,0394	*	0,7816	0,0024	0,4158	OK					
	Abs. return	1-day	~	**Other news**	**+ PSI**	NO	0,7442		0,0941	0,0001	0,9609	OK					
signif.	**Abs. return**	1-day	~	**Other news**	**- NSI**	NO	0,0113	*	0,6700	0,0036	0,2771	OK					
	Abs. return	10-day	~	**Other news**	**OSI**	NO	0,3687		0,4286	0,0005	0,1258	OK					
	Abs. return	10-day	~	**Other news**	**+ PSI**	NO	0,7177		-0,1309	0,0001	0,1799	OK					
	Abs. return	10-day	~	**Other news**	**- NSI**	NO	0,1209		0,5157	0,0014	0,3543	OK					
	Abs. return	1-day	~	**Other news**	**OSI** 10	NO	0,0000	***	3,2802	0,0157	0,0003						
	Abs. return	1-day	~	**Other news**	**+ PSI** 10	NO	0,0748		0,7478	0,0018	0,0596	OK					
	Abs. return	1-day	~	**Other news**	**- NSI** 10	NO	0,0000	***	1,6166	0,0115	0,0035						
signif.	**Abs. return**	10-day	~	**Other news**	**OSI** 10	NO	0,0099	**	2,0133	0,0038	0,1544	OK	0,0099	**	4,1535	0,0037	0,4990	OK
	Abs. return	10-day	~	**Other news**	**+ PSI** 10	NO	0,7593		0,1616	0,0001	0,2624	OK					
signif.	**Abs. return**	10-day	~	**Other news**	**- NSI** 10	NO	0,0075	**	1,2022	0,0040	0,5048	OK					
	Volume	1-day	~	**Other news**	**OSI**	YES	0,0725		0,4081	0,0014	0,4795	OK					
	Volume	1-day	~	**Other news**	**+ PSI**	YES	0,0000	***	-1,8841	0,0599	0,0001						
	Volume	1-day	~	**Other news**	**- NSI**	YES	0,0000	***	2,0334	0,0761	0,0191						
signif.	**Volume**	10-day	~	**Other news**	**OSI**	YES	0,0029	**	0,6156	0,0039	0,5996	OK					
	Volume	10-day	~	**Other news**	**+ PSI**	YES	0,0000	***	-2,1479	0,0940	0,0000	0,0000	***	-4,3828	0,0776	0,0000	
signif.	**Volume**	10-day	~	**Other news**	**- NSI**	YES	0,0000	***	2,4546	0,1339	0,0000	0,0000	***	5,5124	0,1338	0,4207	OK
signif.	**Volume**	1-day	~	**Other news**	**OSI** 10	YES	0,0003	***	1,4699	0,0057	0,1410	OK					
	Volume	1-day	~	**Other news**	**+ PSI** 10	YES	0,0000	***	-3,8975	0,1214	0,0000						
	Volume	1-day	~	**Other news**	**- NSI** 10	YES	0,0000	***	3,7909	0,1431	0,0002						
signif.	**Volume**	10-day	~	**Other news**	**OSI** 10	YES	0,0000	***	1,5345	0,0074	0,1253	OK					
	Volume	10-day	~	**Other news**	**+ PSI** 10	YES	0,0000	***	-4,4519	0,1913	0,0000	0,0000	***	-8,8559	0,1500	0,0000	
	Volume	10-day	~	**Other news**	**- NSI** 10	YES	0,0000	***	4,2554	0,2178	0,0000	0,0000	***	9,6225	0,2207	0,0062	
	Volume	1-day	~	**Other news**	**OSI**	NO	0,0583		0,3807	0,0020	0,1373	OK					
	Volume	1-day	~	**Other news**	**+ PSI**	NO	0,0708		-0,2758	0,0018	0,9623	OK					
	Volume	1-day	~	**Other news**	**- NSI**	NO	0,0000	***	0,5878	0,0099	0,0291						

	Volume	10-day	~	**Other news**	**OSI**	NO	0,0004	***	0,5150	0,0071	0,0000	0,0004	***	1,2219	0,0113	0,0000	
	Volume	10-day	~	**Other news**	+ **PSI**	NO	0,0385	*	-0,2286	0,0024	0,0004	0,0385	*	-0,3234	0,0014	0,0013	
	Volume	10-day	~	**Other news**	- **NSI**	NO	0,0000	***	0,6776	0,0252	0,0000						
	Volume	1-day	~	**Other news**	**OSI** 10	NO	0,0004	***	1,1738	0,0072	0,0017						
	Volume	1-day	~	**Other news**	+ **PSI** 10	NO	0,0610		-0,4169	0,0020	0,0483						
	Volume	1-day	~	**Other news**	- **NSI** 10	NO	0,0000	***	1,0618	0,0177	0,0460						
	Volume	10-day	~	**Other news**	**OSI** 10	NO	0,0000	***	1,7454	0,0303	0,0000						
	Volume	10-day	~	**Other news**	+ **PSI** 10	NO	0,4781		-0,1142	0,0003	0,0072						
	Volume	10-day	~	**Other news**	- **NSI** 10	NO	0,0000	***	1,2218	0,0447	0,0027						
signif.	**Volatility**	1-day	~	**Other news**	**OSI**	YES	0,0000	***	2,0909	0,0093	0,0067	0,0000	***	3,3354	0,0098	0,7210	OK
signif.	**Volatility**	1-day	~	**Other news**	+ **PSI**	YES	0,0000	***	-2,3921	0,0241	0,0137	0,0000	***	-3,9801	0,0275	0,0551	OK
	Volatility	1-day	~	**Other news**	- **NSI**	YES	0,0000	***	4,0105	0,0739	0,0000	0,0000	***	6,5424	0,0811	0,0191	
	Volatility	1-day	~	**Other news**	**OSI** 10	YES	0,0000	***	7,5839	0,0376	0,0000	0,0000	***	12,1303	0,0397	0,0190	
	Volatility	1-day	~	**Other news**	+ **PSI** 10	YES	0,0000	***	-4,7798	0,0456	0,0001	0,0000	***	-7,8468	0,0507	0,0127	
	Volatility	1-day	~	**Other news**	- **NSI** 10	YES	0,0000	***	7,6390	0,1451	0,0000	0,0000	***	12,3753	0,1571	0,0000	
signif.	**Volatility**	1-day	~	**Other news**	**OSI**	NO	0,0002	***	1,4542	0,0079	0,3690	OK					
	Volatility	1-day	~	**Other news**	+ **PSI**	NO	0,7917		0,0782	0,0000	0,4914	OK					
signif.	**Volatility**	1-day	~	**Other news**	- **NSI**	NO	0,0000	***	1,3254	0,0134	0,5492	OK					
signif.	**Volatility**	1-day	~	**Other news**	**OSI** 10	NO	0,0000	***	5,3783	0,0401	0,0862	OK	0,0000	***	11,9243	0,0503	0,9816	OK
signif.	**Volatility**	1-day	~	**Other news**	+ **PSI** 10	NO	0,0342	*	0,9130	0,0025	0,2694	OK	0,0342	*	1,7572	0,0024	0,6052	OK
signif.	**Volatility**	1-day	~	**Other news**	- **NSI** 10	NO	0,0000	***	2,8718	0,0344	0,1201	OK	0,0000	***	6,5556	0,0458	0,8590	OK